THE AUTOMOBILE

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AUTOMOBILING IN PORTO RICO.

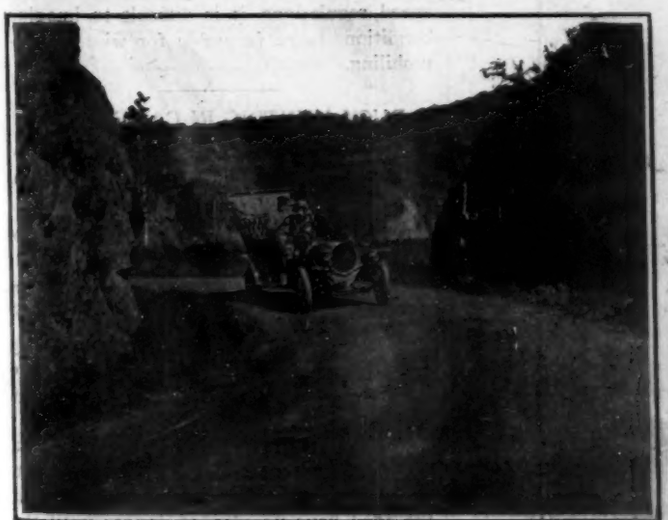
BY A. H. FRAZIER, *Private Secretary to the Governor of Porto Rico*

OWING to the fact that Porto Rico is little known to the traveling public, which annually migrates during the winter months to Florida and other Southern resorts, the splendid opportunities which it offers for automobiling have escaped the notice of enthusiasts. It would be a surprise to many of them to learn that the island is traversed by nearly a thousand kilometers of macadamized roads, passing through some of the most beautiful country in the world, and that this new possession of the United States can be reached in about four days from the port of New York.

Of all the roads of the island the most famous is the Military Road. Constructed in part by slave labor, it connects San Juan and Ponce, the principal cities of the island, situated respectively on the north and south coasts, and will ever remain a monument to Spanish engineering skill. Its easy

Level Stretch of Military Road 2,000 Feet Above Sea Level.

Governor Winthrop's Franklin on One of the New Ornamental Steel Bridges.



Sharp Turn in the Military Road Up Grade in a Rocky Cut.

Old and New Methods of Transportation in the Island.

INTERESTING VIEWS IN PORTO RICO ON THE OLD MILITARY ROAD AND THE NEW HIGHWAY COMPLETED IN 1903.

grades, massive viaducts and general equipment are not surpassed by even the French roads in the Maritime Alps. One hundred and thirty-two kilometers long and rising to a height of two thousand feet in the central mountain chain which divides the island longitudinally, it winds through coffee plantations, banana groves and sugar-cane fields. There are avenues of royal palms in some sections, in others rows of flamboyant trees which in the spring blossom into a gorgeous red, and during the summer months provide grateful shade from the rays of a tropical sun. Kilometers are marked by triangular posts conveniently placed, so as to catch the eye, and at every ten kilometers a large stone indicates the distance from the two extremities.

A second road, completed in 1903, now unites the northern and southern coasts, between the towns of Ponce and Arecibo, Arecibo being situated on the northern coast, considerably to the west of San Juan. It would seem difficult for two roads rising to practically the same altitude and crossing the island within a short distance of each other to present such distinctive features, and yet each has its own characteristics. At the extreme summit of the Ponce-Arecibo route, it is possible on a clear day to look down upon the Caribbean Sea on one side and the Atlantic Ocean on the other. The descent to the north is bold, almost Alpine, and the last stage, from Utuado to Arecibo recalls the gorge of the Yellowstone on a diminished scale. After clinging to the edge of an almost perpendicular cliff for several miles, the road cuts abruptly through the cliff itself, and disappears from view. Between Ponce and Arecibo, there is comparatively little traffic, and those who are fond of bowling over long stretches of deserted road will enjoy the freedom from the long trains of ox-carts which toil over the Military Road. The drivers of these carts, however, are prompt in getting out of the way, and the stranger can count upon receiving from all who use the highways that ready courtesy which is so characteristic of the Porto Rican.

OLD MILITARY ROAD WINDING AMONG THE MOUNTAINS OF CENTRAL PORTO RICO.

While these are the two most important arteries of travel on the island, there are many roads maintained in equally good repair, which are accessible to automobiles. It is true that on the less traveled roads, there are rivers to ford, but during the winter months the weather is apt to be dry and the majority of the rivers containing at that time but a few inches of water, can easily be crossed under power or with the aid of a yoke of oxen.

Gasoline and lubricating oil may be procured in the larger towns, and in San Juan and Ponce there are machine shops capable of undertaking almost any kind of repair work. As showers are frequent in the mountains, it is advisable to equip cars with tops, and an emergency brake is absolutely indispensable.

In the cities of San Juan, Ponce, Mayaguez, Arecibo and at Coamo Springs, the hotels are clean and well kept, but in the smaller towns of the island one must be prepared for discomfort. The tourist will look in vain for the luxurious appointments of the modern hotel, but Spanish cooking is excellent, there is an abundance of tropical fruits, and at the smallest wayside inn it is possible to get a delicious cup of coffee at any hour.

There are two steamship lines running from New York to San Juan, the New York and Porto Rico Steamship Company and the Red D Steamship Company, with a steamer leaving for Porto Rico every Saturday at noon. While it is safer to crate a car for shipment, it is not absolutely necessary, as cars have been sent down with only the lamps and the mud-guards removed. In such case, however, the owner or the chauffeur should personally supervise the loading. Taking all things into consideration, the wonderful climate, the freedom from dust and the absence of vexatious speed regulations, it is difficult to imagine conditions more favorable for winter automobiling.

GUN CLUB OF SAN FRANCISCO RETURNING FROM A DUCK HUNT.

DUCK HUNTING IN CALIFORNIA.

The accompanying engraving shows how the Kubler Gun Club, of San Francisco, goes duck hunting. The trip is usually across the Bay of San Francisco by ferry into Alameda county and down the Alviso marshes. A number of guns are taken along and the bag on the home trip is sometimes large enough to almost obscure the car. The road skirts close along the edge of one of the marshes, which is thickly grown with cat-tails. At this place a number of duck hunters have been using a White steam car instead of a sneak boat. The machine moves along so quietly that the fowl have no idea of danger until the car is directly upon them, when they fly up and give a splendid shot.

Problems in Connection with Auto-boats.*

By CLINTON H. CRANE.

THE very recent development of the so-called "gasoline engine," of extremely light weight in proportion to its power, has given the opportunity of making another step forward in the direction of great speed upon the water.

Up to the present time gasoline engines of extremely light weight have only been available in powers up to 300 horsepower, and in the majority of cases of successful operation in powers not exceeding 150 horsepower.

In utilizing this new form of power up to the present time the size of the boats has necessarily been small. In choosing a type of hull naval architects had to avail themselves of what had already been done in steam.

A glance at the four torpedo-boats, which are illustrated in the accompanying line drawings, will show the very great differences in the shapes of waterlines, profiles and sections adopted by these four successful designers, to produce an easily driven hull. Such difference would seem to show that, with a given displacement and power, the shape of the under-water form, provided it be reasonably fair, was not of the greatest moment, or, rather, that there might be objections to the more easily driven form which made some compromise advisable.

This statement must be modified, as I do not wish to be understood that the services of a skilled naval architect are unnecessary in the building of the fastest possible launch. The saving of weight to the last ounce is a matter of great engineering skill. The choice of a proper propeller, the adaptation of a form which can maintain its speed in rough as well as smooth water—all these are matters calling for the greatest possible training, experience and attention.

AUTO-BOAT "ANTOINETTE" AT SPEED, SHOWING USUAL WAVE FORMATION.

The simile of the skipping stone has been used by a number of engineers in describing the action of these light, high-speed vessels. The idea that a boat should skim over the top of the water and not go through it is by no means a new one.

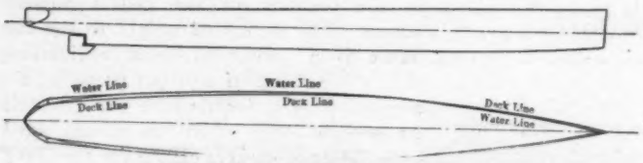
More than thirty years ago a clergyman, the Rev. C. Ramus, was so firmly convinced that all vessels should proceed in this manner that he succeeded in prevailing on the English Admiralty to give his ideas a trial in the experimental tank at Torquay. The result of these trials seemed to show the absolute fallacy of the reverend gentleman's ideas; but the experiments were based on what was then possible in the direction of displacement and power, and with what then seemed a most liberal prediction of future possibilities. We can only feel that Mr. Ramus lived too early.

Two years ago Mr. Yarrow conducted a number of experiments with full-size models of a 40-foot launch towed by one of his 25-knot torpedo-boats. The model which gave the least resistance at this speed was a flat-bottomed scow, which appeared to glide along the surface of the water. Based on this experiment the *Napier II* was designed with such modification of bow as

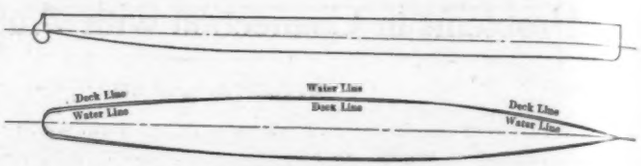
*From a paper read before the Society of Naval Architects and Marine Engineers in New York, in November, 1905.

Data Sheet of Dimensions, etc., of American and Foreign Auto-boats and Torpedo Craft.

Launches.	Torpedo-boats.	Designer.	Length of W. L.	Disp. in lbs or tons in running condition with crew and fuel on board.	Horse-power.	Cylinders.			Maker of engine.	Speed in knots.	Weight in lbs. H. P.	Weight reduced to 40 ft. W. L.	Corresponding speed in knots 40 ft. W. L.
						Number	Diam.	Stroke					
XPDNC.....	.....	Herreshoff.	42.2	3.250 lbs.	75	4	6½	5½	Mercedes..	23.0	43.4	2,750	22.4
Napier ..... (Twin screw.)	.....	Yarrow	40	7,170 lbs.	150	8	6½	6	Napier	25.98	47.8	7,170	25.98
Dixie	.....	Crane.....	40	5,160 lbs.	150	8	6½	6¾	Smith & Mabley.	26	34.4	5,160	26
Veritas.....	.....	Gielow	56	12,000 lbs.	283	8	7⅞	9	Craig.....	23.2	42.4	4,370	19.6
Panhard.....	.....	Electric Launch Co.	39.91	3.621 lbs.	70	4	6 5/16	6.68	Panhard....	23	51.7	3,621	23
Vingt-et-Un II.	....	Crane..	38.75	3.850 lbs.	75	4	6½	6¾	Smith & Mabley.	22	51.4	4,225	22.35
	Normand torpedo-boat.	.....	157	168 tons.	3,920					29.15	96	6,250	14.7
	Yarrow torpedo-boat.	.....	152.7	144 tons.	2,000					25	161.5	5,800	12.8
	Herreshoff torpedo-boat.	....	175.5	165 tons.	3,200					28.6	115.5	4,380	13.65
	Thornycroft torpedo-boat destroyer.	....	244	420 tons.	8,000					29	117.5	4,160	11 75



NORMAND TORPEDO BOAT.
Length, 157 Feet. Displacement, 168 Tons. Speed, 29.15 Knots.



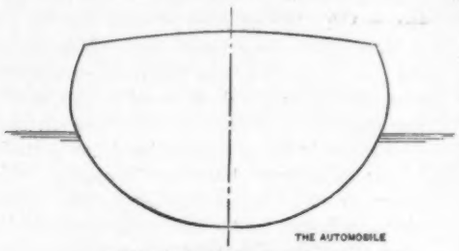
YARROW TORPEDO BOAT.
Length, 152.7 Feet. Displacement, 144 Tons. Speed, 25 Knots.

seemed essential for a boat which would be called upon to perform in a seaway.

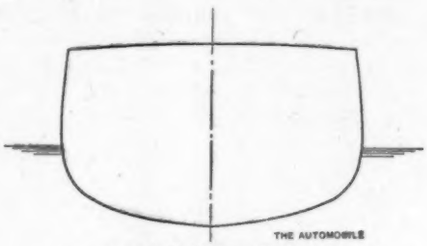
The final successful trial of this boat was made in March of last year on the Thames

This seems to confirm Mr. Yarrow's conclusion that in boats of this size and going at this speed the skimming idea gives the lesser resistance. It is, however, associated

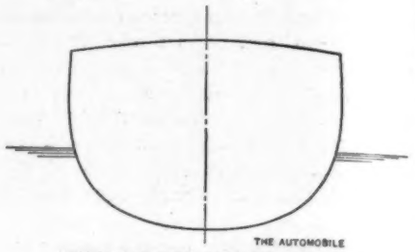
on the whole fabric, which necessitates heavier construction and does away with the possible advantages gained by this particular form of hull.



NORMAND TORPEDO BOAT.



YARROW TORPEDO BOAT.



HERRESHOFF TORPEDO BOAT.

at Greenwich, and a speed of practically 26 knots was attained. The boat was driven by two 4-cylinder *Napier* engines, and the displacement on trial was 3 tons 4 cwt.

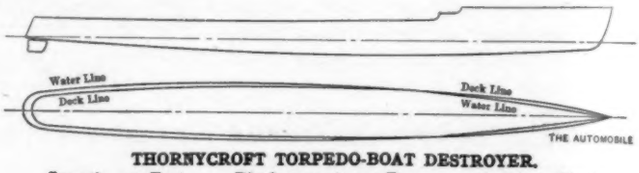
This gives us a very interesting comparison with the *Dixie*, which was driven by a

with the form of hull, which is very badly adapted to maintaining high speed in a seaway.

As a matter of fact, in spite of her extra weight of hull, *Napier II* was obliged to withdraw from a number of her races, owing to leaks caused by the pounding of her flat bottom on the waves.

The most serious objection to sharp bows and "toothpick" sterns, as they used to be called, is the loss of stability which this form involves. Apparently this loss of stability is much more serious and more noticeable at high speeds than at low.

HERRESHOFF TORPEDO BOAT.
Length, 175.5 Feet. Displacement, 165 Tons. Speed, 28.6 Knots.

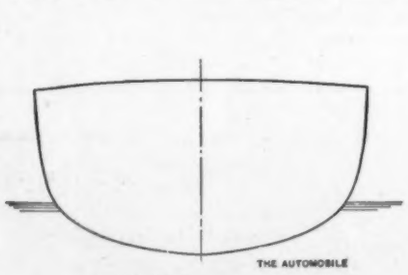


THORNYCROFT TORPEDO-BOAT DESTROYER.
Length, 244 Feet. Displacement, 420 Tons. Speed, 29 Knots.

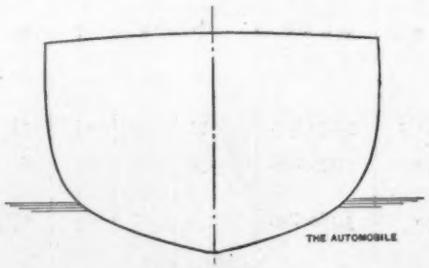
single engine of 8 cylinders of the same diameter and slightly greater stroke. It may be reasonably assumed that the powers developed in the two boats are practically

I think no one will question the fact that sharp ends and sharp floors go through a

Whether this is entirely due to the increased torque of the propeller is a matter about which the writer is not yet entirely clear. This torque of the propeller in a



HERRESHOFF LAUNCH.



"DIXIE"

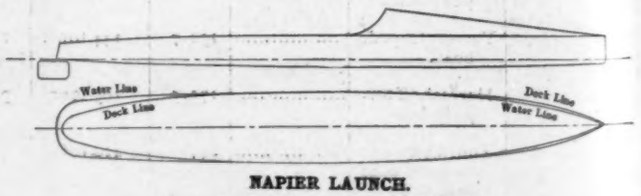
NAPIER LAUNCH.

the same. The speed attained by the *Dixie* was practically the same, although her displacement is nearly 2,000 pounds less than that of the Yarrow boat.

sea with far less shock and trouble than extremely full ends and flat floors. It is not so much that the flat floors stop a boat's progress as that they put a shock and jar

fast single-screw launch is a matter of serious consequence. In the case of the *Dixie*, running at full power, this torque amounts to placing a weight of 350 pounds at the

HERRESHOFF LAUNCH.
Length, 81 Feet. Speed, 22 Miles.



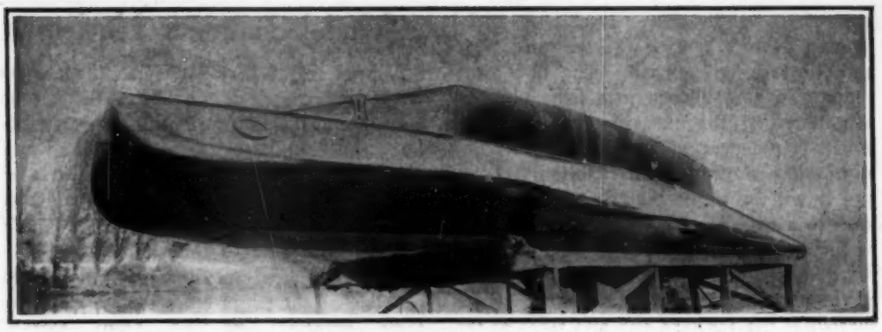
NAPIER LAUNCH.
Length, 40 Feet. Speed, { 22 Knots. 25.9 Knots. (?)

gunwale, or about 8 per cent. of the boat's weight.

This can, of course, be partially compensated for by placing the machinery off the center. Unfortunately, however, for the comfort of those on board this torque is by no means a constant quantity. If the boat throws her wheel out of water, even to a small extent, in the hollow of a wave, this torque is suddenly relieved and the recoil in the opposite direction is sudden and disconcerting.

It is possible that this increase in torque may alone account for the trouble which a number of the high-speed boats have experienced this summer. In designing the *Dixie* this matter was carefully considered, and she was given practically the same metacentric height as the *Vingt-et-un II*, *Vingt-et-un II's* G. M. being .725 and the *Dixie's* G. M. .675. It was expected that the increase in torque could be compensated for by the placing of the crew.

In actual result *Dixie* behaves very much as the *Vingt-et-un* did up to 21 or 22 knots. If driven faster than this in a seaway she becomes very cranky, rolling so deep as to shake the nerve of the uninitiated.



VIEW OF THE NEW DE DIETRICH AUTO-BOAT SHOWING FOREBODY.

placement, which increases the slip on the descending blade and decreases it on the ascending. This difference of slip is as much as 4 or 5 per cent. That is, if the slip of the descending blade is 25 per cent., the slip of the ascending blade would be 20 per cent.

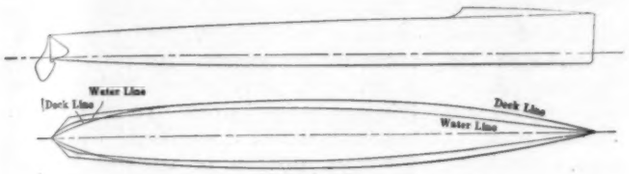
In the *Dixie* we have been using a propeller, to obtain the maximum speed, of 23 1-2 inches diameter, 32 inches pitch, with a surface ratio of 55 per cent., this wheel turning 1,120 revolutions. The boat has not been raced with this wheel, as the piston speed is a little excessive for long-continued running.

This wheel should be perilously near the point of cavitation. As a matter of fact, I have encountered cavitation this year on a smaller wheel, running at fewer revolutions in a slower hull.

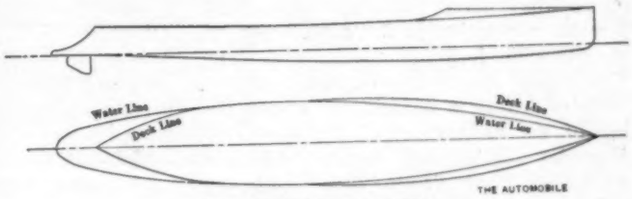
There is one more point about the shape of the model which is worth consideration. the sharp-bowed boats throw a much smaller bow wave than the full-bowed ones.

This mass of water, although it is usually a thin, transparent film, adds greatly to the discomfort of those on board. The boat driving along at nearly 30 miles an hour against a wind and sea, this water strikes the face as from a fire hydrant.

The accompanying table will be of interest. The lengths, weights, speeds and sizes of cylinders I can vouch for as being correct. The horsepowers of the gasoline engines are, with the exception of the *Vingt-et-un II*, subject to a general calculation, and are based on the sizes of the cylinders and an assumed piston speed. They are certainly accurate within 10 per cent. The column $\frac{\text{"Weight in Pounds"}}{\text{H. P.}}$ is one of extreme interest. As all these boats were actually weighed by disinterested parties the results can be taken as accurate.

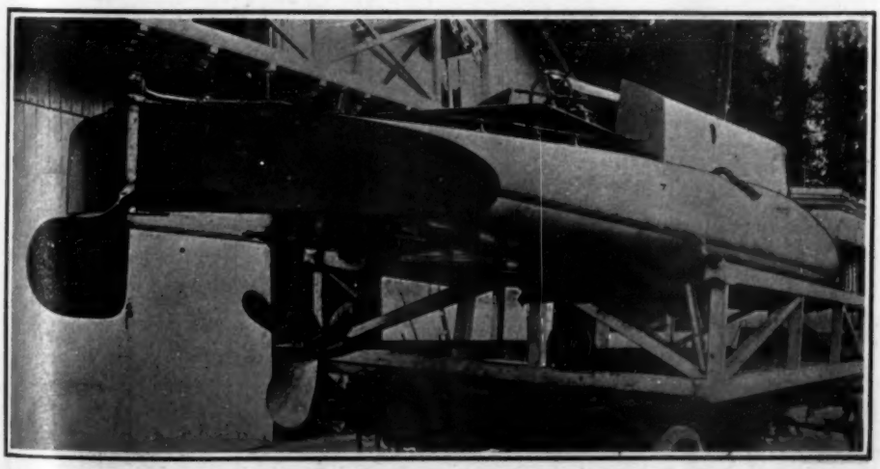


"DIXIE."
Length, 40 Feet. Speed, 23 Miles.



THORNYCROFT LAUNCH.
Length, 30 Feet. Speed, 19 Miles.

It has been found necessary on all these boats to use a comparatively large-size rudder. The uneven thrust of the screw gives a very strong pressure to deviate from the course. Right-handed screws throw the stern to starboard, left-handed to port; this no doubt being partly due to the fact that the bottom of the screw is working in more solid water, and partly to the rather rank inclination of the shaft made necessary by the large power and extremely light dis-



TERN VIEW OF NEW DE DIETRICH AUTO-BOAT.—Note horizontal position of propeller shaft, which is chain driven from motor shaft.

There are, besides the boats enumerated in this column, a number of others which, as a matter of general interest, should be mentioned, but I was unwilling to publish any figures unless I was certain of their accuracy.

The photograph of the *Antoinette*, taken from above, shows most plainly the usual wave formation. So far as one can see there are a series of bow waves unaccompanied by the usual transverse series. The boat at these speeds apparently makes a hollow for herself which is filled in the case of the flat, stern launches by a mass of suds and spray rising sharply several feet astern.

In my opinion, for the best use we need a compromise between the extremely sharp and the extremely flat types. It is in arriving at this compromise that the naval architect can best show his skill.

With this extremely interesting sketch of the subject we print two photographs of the latest Dietrich auto boat, which, though

not referred to by the author, is of special interest as representing the latest ideas in auto boat design abroad. The bow view suggests a resemblance to a fish, which is heightened by the excessive tumble home, which commences at the very stem. The stern view shows a remarkably flat floor, and it will be noted that the propeller rotates in a true vertical plane, the angularity of the shaft being avoided by using a chain drive housed in a casing at the forward end of the propeller shaft. The coaming which surrounds the forward end and sides of the cockpit appears to be unusually high. Our regular readers will recall the performances of the *Dixie*, which have been referred to from time to time in these pages.

EDITOR.

Austrian Armored Automobile.

PARIS, Nov. 8.—An automobile of a unique character is being tested by the Austrian military authorities. Not content with using the new form of locomotion for the transfer of provisions and ammunition, or for reconnoitering—work for which the automobile is especially adapted and to which it has been put by nearly all European war offices—the Austrian authorities have sought a wider application in the construction of an automobile fort.

A model has been constructed at the Daimler factory in Austria, the chassis being of the ordinary type, similar to the Mercedes touring car chassis. All four wheels are direct driven, there being two differentials and two transverse springs. By this arrangement the vehicle can be started and run over any kind of road, and experiments which have already been made showed that it could go down into a ditch and come out again without any difficulty, while crossing a rough field was quite within its possibilities. Steel-sheathed Arbel wheels similar to those which had been tested by Serpollet at Nice at speeds of seventy-five miles an hour are used. The whole of the automobile—a 40-horsepower machine—is enclosed, not even the radiator being exposed. The chauffeur occupies the usual position, but, when necessary, even he is made to disappear from view, and the machine has then the appearance of a block house, the only openings being those by which the driver looks out, and others in the turret at the rear, through which appears the muzzle of a machine gun.

The fighting automobile carries only two men—a driver and a gunner—and its speed on ordinary roads is about thirty miles an hour. Only one model of this war automobile exists, but the idea does not belong exclusively to Austria, for a few years ago the firm of Charron, Girardot & Voigt exposed at the Salon a machine on almost exactly the same lines.

Queen Margherita, of Italy, proposes to undertake an extended auto tour throughout the United States next spring, it is reported, and has already ordered a 40-horsepower Fiat for this purpose.

Model Garage in Harlem.

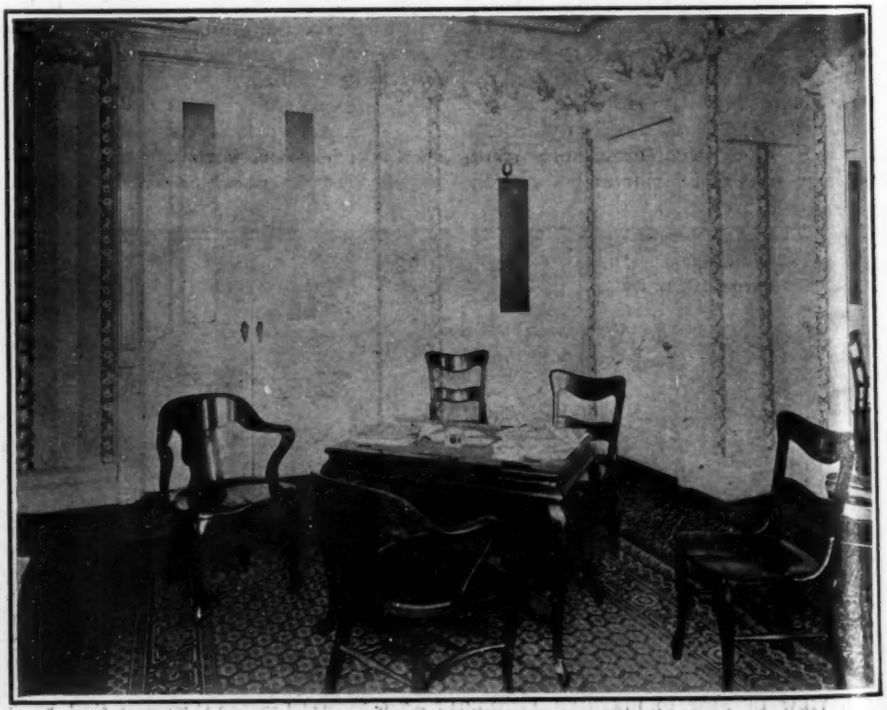
FAITH in the permanency of the present popularity of automobiling is expressed in a practical dollar-and-cents way that nobody can doubt in the large number of new garages that are being erected in nearly all the Northern cities for the storage and care of automobiles for owners. A great many of these are being established in the residence sections of the different cities, indicating that the proprietors expect to derive their principal revenue from storage charges and repair work rather than from the sales of new cars. Until recently, in New York city, nearly all of the new garages that were constructed were located in or near the automobile selling centers of town, either on Thirty-eighth street or on Broadway north of Longacre Square. This fall, however, there has been a movement to give the great residential districts of Harlem and Washington Heights better car storage facilities.

Of the new storage stations recently opened in upper Manhattan Island the largest, best arranged and best equipped is that of the Palace Automobile and Machine Company at 208 West One Hundred and Twenty-fourth street, near Seventh avenue. This is in a large residence district inadequately provided with accommodations for the care of automobiles. It was formally opened the evening after election night and already has attracted considerable trade.

The establishment embraces a new brick building 96 1-2 feet by 50 feet and two stories high and an old private residence 25 feet wide, remodeled. The ground, the buildings and their equipment represent an investment of more than $100,000. The buildings provide accommodations for about 125 cars at the present time, and it is the intention to add two more stories to the new structure next spring.

The utmost care has been taken to provide against fire; not only is the new building of fireproof construction with cement floors throughout, but there are automatic fire doors connecting the new and old buildings, the supplies of fuel and oil are stored in fireproof rooms outside of the new building, electric incandescent lamps only are used for lighting, and the washing of engines with gasoline and kerosene is required to be done in the open air.

The new building has a wide sliding door entrance for cars, to one side of which is a 5,000-pound lift elevator with separate entrance and giving access to all floors and the basement. On each floor is a revolving overhead washer, so that a car can be run on to the elevator from the street, taken to the floor where it is stored, washed, and run to its standing place, with a minimum of handling. The ground floor and part of the second floor are used for storage. The rear half of the second floor is used as a machine shop. It is equipped with one new 8-foot lathe with 14-inch swing, another 14-foot lathe with 25-inch swing, a 16-inch shaper, a drill press and a three-piston air compressor. All the machinery is driven by an electric motor using the Edison company current. To the foregoing are being added a pneumatic riveter and pneumatic drill to be operated by compressed air under 200 pounds pressure. Tires can be inflated on any floor with compressed air at 100 pounds pressure from the same tank. Interesting features of the machine shop are three pits sunk in the



WAITING AND DRESSING ROOM FOR WOMEN IN THE PALACE GARAGE.

NEW GARAGE RECENTLY OPENED IN RESIDENTIAL SECTION OF HARLEM, NEW YORK CITY. NOTE, GARAGE OCCUPIES BOTH NEW AND OLD BUILDINGS.

floor to a depth of 5 feet, enabling a man to work underneath a car in comfortable standing position, with movable incandescent lights and drain pipes leading to the sewer, and the toolroom, where the checking system is in use. The tools are carefully arranged in small spaces that receive but one or two articles, and whenever a workman receives a tool or piece of material a brass check is deposited in place of the part, so that an instant's glance shows when a tool is out and who has possession of it.

On the top floor of the building are stored lamps, tops and various fittings left in charge of the manager by owners of cars and kept under lock and key.

Opening off the ground floor and on the street floor of the old building are quarters for chauffeurs embracing a club room, a reading room and lavatories. In the basement of this building is a brick fireproof room for the storage of cylinder and engine oils kept in Bowser tanks. In the detached brick room in the rear yard is the boiler for heating both buildings and a heater supplying hot water for use in the garage and for the baths.

Buried ten feet in the ground back of the boiler room are two gasoline tanks of 250 gallons' capacity each and a large kerosene tank. Measuring pumps of the Bowser make, connected with the tanks, are housed in a fireproof tank house that is on a level with the top of the boiler or furnace room. The roof of this room is of concrete and is on a level with the ground floor of the garage, so that cars can be run out on to it for filling of the tanks and for washing off the engines and machinery with gasoline or kerosene. Pipes from the fuel tanks lead to the street in front of the building, where direct connection can be made with the delivery tank wagons.

The office of the garage occupies the front of the main floor of the old building, with entrance opening on to the front steps and a side entrance opening by a short flight of stairs onto the ground floor of the garage proper. Directly back of the office is an attractively furnished waiting room for women patrons, with toilet room and large mirrors. On the floor above is a room for men, with individual pressed steel clothes lockers, and adjoining bathroom and shower bath. Adjoining this is a locker room for chauffeurs.

Nothing, apparently, has been left undone or unprovided for to facilitate the safe handling of cars, to insure the highest class of repair work and to provide in a practical way for the convenience and comfort of patrons and their chauffeurs. All the rooms are amply lighted by generous windows.

The officers of the Palace Automobile and Machine Company are Edgar M. Houpt, president; Hamilton Farnham, vice-president; and Charles H. Darmstadt, business manager.

RULES FOR SICILIAN CIRCUIT.

PARIS, Nov. 8.—Rules for the "Targa" Florio fix the date of this important event for May 5, 1906, on a circuit of 187 to 260 miles in Sicily. The race is open to all cars, of which the catalogue price of the chassis is below $4,000, and entries are to be received by the Committee of Fetes, at Palermo. No firm can engage more than six cars, and three of these may be entered by the factory and three by private owners. In case a factory has not directly entered for the race, six private cars may be entered. Entries close twenty days before the event for factories and fifteen days before for private owners. Every entry must be accompanied by the catalogue, together with the price of the chassis and the stroke and bore of the engine, and every automobile entered must be in absolute conformity with the model described in the catalogue. Any car found to be not in complete conformity will be disqualified. New models will always be preferred to those of earlier years, and short chassis to long ones. Commissioners will have the right to disconnect a cylinder before the course, in order to see if the dimensions are exactly those stated, any irregularity in this respect entailing disqualification. Each car must carry two racing seats, and the weight when empty must be not to exceed 2,860 pounds for automobiles from $3,000 to $4,000, and 2,200 pounds for automobiles costing less than $3,000.

Order of starting will be decided by the drawing of lots in the following manner: The names of all the firms engaged will be written on separate cards, the first to be drawn being the first to start and all being sent away in the order in which they are drawn. The names of the drivers will be drawn in a similar manner.

The Targa Florio will become the complete property of the winner, and the $10,000 in money will be awarded in different amounts to the first five winners.

Entries for the Sicilian meeting have already been made, the first engagement being that of three Ariès automobiles. Renault Frères have entered one car and the Darracq, Radia, Berliet and Dolores cars will almost certainly be starters. Among Italian cars it is known that Fiat and Itala will be entered.

Guy Kept Tanked Up.

Guy Moses and wife returned Tuesday from a five-day trip to Waupaca. Guy went by the auto route of course, and being his own chauffeur, satisfied himself several times along the route to see whether his tank was going dry. He reports no accidents. They also went to Ogdensburg, Stevens Point and other sections, with the auto, making in all about 400 miles.—Antigo (Wis.) *Item.*

Low and High Tension in Magneto Ignition.

(*From the Autocar. Continued from page 522, issue of November 9.*)

RELATION BETWEEN VOLTAGE, CURRENT AND RESISTANCE OF THE CIRCUIT.

IN any case, the motion of the conductors produces an electromotive force (measured in volts), which forces a current through the circuit. The voltage given by a coil depends on the number of turns of wire, and the current depends on this voltage and on the resistance offered by the coil itself, together with other parts of the circuit, to the flow of the current. A given voltage will manifestly force a larger current through the circuit when the resistance is low than when it is high.

From what has been said, it will be seen that the current will be of sufficient strength to do useful work only during certain parts of each revolution, namely, at the periods surrounding the maximum positions. If, therefore, the work which we require to do is of an intermittent character, a current of this kind is specially suitable, since, broadly speaking, it may be said to flow only when required.

To produce a spark at a given point in the circuit, it is only necessary to break

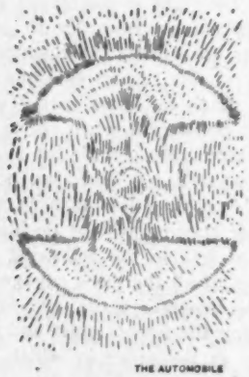


FIG. 11.—FIELD OF MAGNETIZED H ARMATURE CORE.

the circuit suddenly at that point just at the moment when the current is at or near its maximum value. It is clear, then, that the magneto must be driven in a positive manner and correctly set, so that its maximum position may coincide as nearly as possible with the time at which the spark is required.

If the spark is to be "timed" in the usual manner for varying speeds of the engine, it is clear that the exact maximum current cannot always be utilized. If we set the magneto in such a way that the spark when fully retarded occurs exactly at a maximum position, it follows that when the spark is advanced, and so is required earlier, the maximum will not have been reached. At high speeds, however, the magneto will have a stronger current, and consequently it will be capable of giving a good spark at a considerable distance from the maximum. This is especially fortunate, as with increased speeds the maximum occurs later, for a reason which we shall now attempt to explain.

When a current passes around the armature coil, the soft iron core becomes an

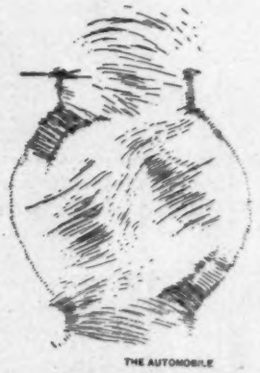


FIG. 12.—MANY LINES STILL THREADING COIL. SMALL CURRENT.

electro-magnet. The field of force produced by the armature core is indicated in Fig. 11, and it will be seen that at the time when a current is flowing through the coil the core stands in the position shown and the general direction of the lines of force is vertical. The effect of this is to distort the horizontal field due to the field magnet and the combination of the two fields is shown in Fig. 12. The direction of rotation of the armature being that of the hands of a clock, this means that the lines of force are pulled forward through an angle and the conductors do not cut them so soon. In other words, the maximum position is retarded.

The greater the speed of the magneto and the resulting current in the armature, the greater the distortion of the field and the consequent retardation of the maximum position. Hence at high speeds, when the spark is required earlier, the "maximum" becomes later and the spark must necessarily occur some time before this maximum is reached.

As has already been said, the current given by the magneto at high speeds is sufficiently strong to allow of a spark being obtained under these circumstances, so that under ordinary working conditions this distortion of the field does not effect results to the extent which might be expected.

BREAKING THE CIRCUIT IN THE CYLINDER.

We may now consider how the necessary break of the electrical circuit may be obtained in the cylinder. There are two distinct methods between which to choose: (1) Mechanical break, in which the contacts are separated by a mechanism, the principal features of which are a cam and a spring; (2) Magneto-electric break, in which the current itself causes the break, by virtue of the magnetic effects produced by it.

Fig. 13 is a diagram illustrating the first of these methods. *A C* represents the armature coil, one end of which is in connection with the insulated contact point *C*. The other end is connected through the frame with the swinging arm *S A*. This arm is connected to and turns with the pivot *A*, to which the lever *L* is also rigidly attached. When the cam continues to rotate in the direction of the arrow the rod *R* falls suddenly under the action of the spring *S*. The nut collar *N* then strikes a part of the lever *L* and the arm *S A* is suddenly forced out of contact with the contact point *C*. If a current happens to be flowing in the circuit, a spark is then produced at *C*. The light spring *S S* brings the lever and arm up into position again as soon as the cam allows it to do so. If this diagram be compared with Fig. 9, there should be no difficulty in understanding the general arrangement. The contacts *C* (Fig. 13) now take the place of the coil *C* (Fig. 9).

Fig. 14 shows the second method of producing a low-tension spark. It should be understood that these figures are simply diagrams, and do not necessarily represent apparatus used in practice; they serve only to illustrate the principles of action. In Fig. 14, the armature coil *A C* is connected with the wipe blades *W*, which from time to time complete the connection through the coil *H C*. This coil is wound on a hollow spool and forms what is called a "solenoid." After passing round the coil, the current flows into the iron plunger *I R*, across the contact points at *C*, and thence completes its circuit through the frame.

Let us consider what happens so long as the wipe contact allows the current to flow. As soon as the connection is completed,

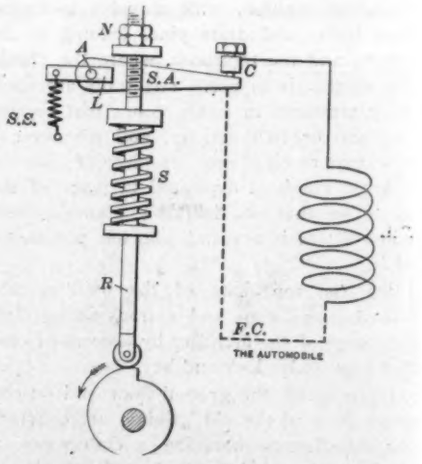


FIG. 13.—MECHANICAL BREAK ARRANGEMENT.

A, lever pivot.
A C, armature coil.
C, points of contact.
F C, frame connection.
L, lever connected to S A.
S S, restoring spring.
N, tappet adjusting collar and nuts.
R, tappet fitted with roller.
S, rapid breaking spring.
S A, swinging arms.

the current flowing around *H C* causes the iron plunger *I R* to be drawn up in the solenoid, and thus breaks contact at *C*, giving a spark between the points as they separate. This connection being broken, the current ceases to flow and the iron plunger

moves back, again completing the circuit. The same action is then repeated. It will be seen that the method is analogous to that of the trembler of a trembler coil.

There is one difference. In the case of the trembler, the spark between the points

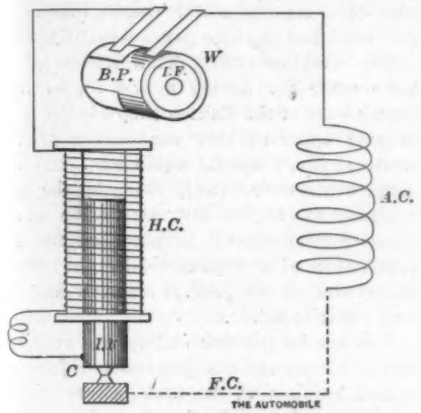


FIG. 14.—ELECTRO MAGNETIC BREAK ARRANGEMENT.

A C, armature coil.
B P, brass piece.
C, contact points.
F C, frame connection.
W, wipe contact blades.
H C, hollow coil or solenoid.
I F, insulating fiber.
I R, iron rod or core.

is minimized by the action of a condenser, whereas in the present instance the existence of the spark is essential. In fact, the coil *H C* is beneficial, in so far as it tends to cause more violent sparking than the mechanical break of Fig. 13. This is due to a phenomenon known as self-induction, with which we cannot deal at this point. It is a well-known fact that it is more difficult to break, without spark, a circuit containing coils than one containing only a length of straight wire. Something like this arrangement is adopted in electro-magnetic plugs. Although two coils are shown, only one is essential.

Before leaving the subject of low-tension magneto ignition, it should be clearly understood that the arrangement of armature and field magnets at present described is by no means essential. It has been chosen for description as the commonest form in use at present. What is necessary is merely some arrangement that will cause the armature coils to cut the lines of force in the field. This may be done in many ways.

For instance, field magnets of the shape shown in Fig. 15 might be used and the armature rotated between them. Again, the armature might be fixed and the field magnets rotated. This system would give a current of equal strength, and offers certain advantages. By building up into a flywheel, the greater part of the weight of the magneto may be saved, since the field magnets now only occupy a position where masses of iron would in any case be required to insure the steady running of the engine. Further, the electrical connections do not have to pass from a rotating armature to a fixed plug, and consequently collecting rings and brushes can be dispensed with.

To take full advantage of this method, it would probably be necessary to have the magneto designed to adapt itself to each separate make of engine. In other words, the makers of the engine would be obliged to give special attention to the ignition arrangements, instead of merely buying and fitting some well-known magneto.

High Tension System.

To obtain a simple idea of the high-tension magneto, let us take an ordinary battery system and replace the storage battery or dry batteries by a low-tension magneto machine of the type already described, and consider the effect produced. For this purpose we may refer to Fig. 16, which shows a simple circuit, with non-trembler coil and make-and-break contact, suitable for a single cylinder engine. The primary circuit only is shown.

The current from the battery or magneto *A* would flow, so long as the circuit were closed, to the primary coil *P C*, across the contacts *C*, and back through the frame connection *F C* and the switch *S*.

The secondary current only springs into existence at the moment when the platinum contacts *C* separate. At this moment, then, the magneto must be giving a strong current, otherwise we have a parallel case to that of an exhausted storage battery, giving so weak a primary current that the resulting secondary current, at the moment of "break" cannot cross the air gap at the sparking plug.

But we have already seen that the current obtained from a magneto of the usual type is of a fluctuating nature, rising to a maximum and falling to zero periodically. It is evident, then, that the magneto must be positively driven at a suitable speed, and must be so set that a maximum position invariably occurs at, or near, the moment

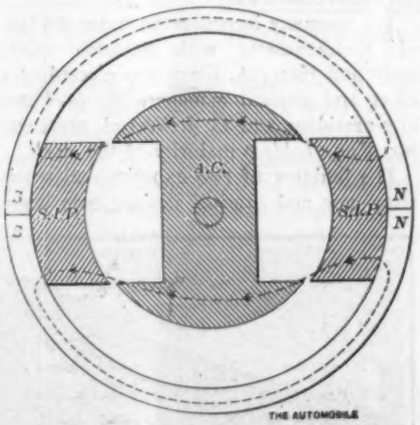


FIG. 15.

A C, armature core.
S, south poles of semi-circular field magnets.
N, north poles of semi-circular field magnets.
S I P, soft iron pole faces.
The dotted lines show the general direction of the lines of force.

of "break." With a positive drive it would therefore be possible to employ a magneto in the way shown in the figure—a method of wiring well known to all motorists. But the results obtained would not be as good as may be obtained by modifying the wiring.

For one thing, there would be no reduction in the number aud length of wires needed. Further, with the switch "off," the magneto would be running on open circuit. Also, the contact-breaking mechanism might, with advantage, be combined with the magneto machine itself. Another point, too, is worthy of notice. When any circuit containing a coil is suddenly broken, the coil has the effect of prolonging the flow of the current and making the break less rapid. This is due to a phenomenon known as self-induction, to which we shall refer later.

It will be seen, then, that a current from the magneto would not be as effective as a current of the same strength from a storage battery, owing to the comparatively slow

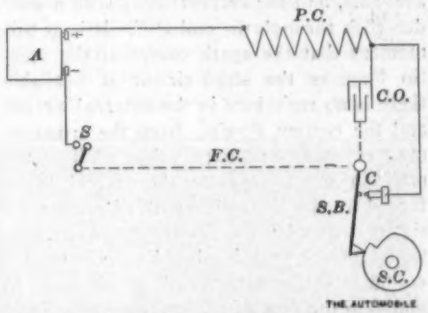


FIG. 16.—A PRELIMINARY EXAMPLE OF WIRING ARRANGEMENT.

A, accumulator (or magneto)
P C, primary winding of induction coil.
C O, condenser.
C, platinum contact
S B, spring steel blade.
S C, steel cam.
F C, frame connection.
S, switch.
C L, contact maker lever.
T1, T2, magneto connections.

break due to the self-induction of the armature coil. Again, the current from a magneto is dependent on the resistance of the circuit through which it flows. The greater the resistance, the smaller the current. The method of wiring shown in Fig. 16 introduces the induction coil and contacts in the main circuit, with the result that the magneto never gives as strong a current as it would do were it running on short-circuit.

We have already emphasized the fact that a magneto may be short-circuited with impunity. We shall now employ this knowledge to alter and adapt our system of wiring to the changed conditions.

Wiring with Magneto in Circuit.

Fig. 17 shows the improved arrangement. The cam *C S* is now on the armature shaft, and the whole contact-breaking mechanism and the wire from T_2 to the switch. The condenser is, of course, enclosed with the coil, leaving only the wire from *C* to *P C*, and the wire from T_2 to the switch. The number of wires is thus reduced.

It will be seen that the contact-breaker is now wired in parallel with the coil, instead of in series with it. In other words, when the switch is closed, and the platinum contacts are together, there are two alternative paths for the current. One of these is from

T_1 to C and straight back through the frame to T_2. This circuit contains no coil other than the armature coil. The resistance of the external circuit is negligible. The other circuit is through the primary winding P C, and offers an appreciable resistance.

When both circuits are closed, almost the entire current will flow through the short

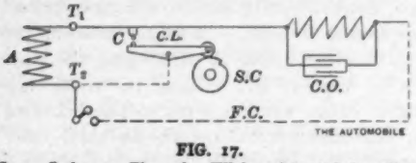


FIG. 17.
Same Index as Fig. 16. Wiring Adapted for Magneto, but with Switch in the Usual Position—Which Is Wrong.

circuit across the platinum contacts. When these contacts separate, only one path is available, and the current flows with a sudden rush through the coil P C. It is at this moment that the spark passes at the plug. So long as the short-circuit is available there is no resistance in the external circuit, and the current flowing from the armature may reach a very high value. When the platinum points separate, the current, being forced to pass through a path of greater resistance, decreases considerably in strength. Consequently, a self-induced current is generated in the armature coil, which tends to maintain the flow of the current in the same way as it would do were the circuit broken altogether, only to a smaller extent. This self-induced current acts in such a direction as to increase the sudden rush of current to the primary coil. It will be seen, then, that the self-induction is now put to a useful purpose, instead of being disadvantageous, as in Fig. 16, and that Fig. 17 gives a more compact ignition system, with less wiring.

(To be continued.)

OBJECT TO TOLL ROAD RATES.

CINCINNATI, Nov. 20.—The Cincinnati Automobile Club is preparing to make war on the toll roads of Hamilton and Clermont counties in Ohio and Kenton and Campbell counties, in Kentucky. The club will send a delegation to Columbus this winter to demand legislation to reach the two counties in Ohio. The members who live in Kentucky will endeavor to secure similar legislation affecting the counties in that state.

The complaint is that the toll roads companies charge extortionate rates. Automobile owners claim that the Ohio law provides that toll shall be collected on vehicles drawn by a horse or other animal; that this law was made before the automobile era, and that, therefore, automobiles do not come within the scope of the law, and consequently no tolls can be collected legally. The toll road owners contend that the automobile is a vehicle and, not being particularly specified in the law, they can fix their own schedule of charges.

At a smoker to be given by the members of the Cincinnati Automobile Club on December 2 the toll question will be discussed.

A Factory for Commercial Vehicles.

THE only large factory in the country built and operated exclusively for the manufacture of industrial automobiles stands less than a mile from the business center of Springfield, Mass. Directly in front, on a tract of meadow land, has been opened a new subdivision, embracing half a dozen or more city squares, upon which have been erected during the past summer many attractive two-story frame residences with ample lawns on all sides. The rear abuts immediately upon the tracks of the New York, New Haven and Hartford Railroad, which affords excellent shipping facilities. The city street car line passes the factory but two squares from the door. Many of the skilled machinists will make their homes in the new houses between the car line and the plant.

The factory is of modern brick mill construction, 215 by 50 feet in size, two stories and basement. It represents a large outlay of capital and is the most practical sort of evidence of the faith in the future of the commercial automobile in America possessed by Harry A. Knox and other successful men of Springfield. The factory represents only one-third of the plant, for which plans have been drawn, and stands on a plot of ground 225 by 400 feet owned by a company organized December 1, 1904, under the name Knox Motor Truck Company. Owing to fear of a popular confusion of identity, a temporary injunction against the use of this name was secured by the other automobile company with which Mr. Knox was for several years associated and which carries his name. To avoid any such confusion of the products of the two plants, the new company adopted the trade name "Atlas" for the trucks which it is manufacturing.

The company incorporated under the laws of Massachusetts with $150,000 capital stock and Harry A. Knox was elected president and general manager, W. S. Pease, vice-president and C. J. Wetzel, treasurer. Mr. Knox holds a majority of the stock.

The building of two experimental trucks after new and original designs was begun immediately, the work being done at the shop of the Bausch Machine Tool Company, in Springfield. The result of experimental tests made with these trucks was the adoption of a type of motor wagon illustrated and described in these pages August 31 last.

This very necessary detail settled, plans were made for having a first lot of fifty trucks built at the Bausch shops, but it soon became apparent that the nature of the work required special equipment, and arrangements were quickly made by the new company to erect its own factory, in which every facility should be provided for the production of the parts under the direct supervision of the general manager and his own superintendent.

The site for the new factory was acquired and work on the building started January 2, and by June 15 the manufacture of the trucks was begun in the new plant. The first complete vehicle was turned out and delivered August 12, when it was sent to Boston under its own power. Although designated a two-ton truck, it carried a load of 5,000 pounds, and, in addition, four persons and their baggage, bringing the total load up to 5,940 pounds. The full distance of ninety-nine miles from Springfield was covered in 11 hours, 30 minutes, but the actual running time was only 10 hours, 19 minutes. During the trip only two minutes' delay was caused by mechanical trouble, which consisted of a loosened battery connection.

Another Atlas truck of the same size was delivered in August to the New York agent, A. L. McMurtry, by road under its own power with a heavy load of sand in bags, as a demonstration run. By that time the new plant was getting out the trucks at the rate of two a week. It was employing a force of sixty men, which was being added to each week. Two models were under construction—the two-ton trucks, designated Model A, and a three-ton truck, after the same design, but heavier and with larger body, called Model B.

If ample elbow room, floods of bright daylight from a clear sky, comfortable

FACTORY ERECTED IN SPRINGFIELD, MASS., EXCLUSIVELY FOR THE MANUFACTURE OF ATLAS TRUCKS.

working temperature, wholesome air, the most modern machinery, shop cleanliness and considerate treatment of the workmen have as much influence upon the quality and quantity of work performed in a shop as progressive managers believe, the very best results should be obtained in this Springfield factory.

Upon entering the doors the visitor steps at once into the office and reception-room, which is made most attractive to the eye by the dark-stained woodwork trimmed in white. The room is of generous proportions, having a railed desk for cashier and bookkeeper at one end and at the other a large table, on which are piled the successive issues of the American automobile publications. Doors at the rear of this room open into a passageway from a side entrance and off the passageway open a number of coat rooms and wash rooms. One of the doors also opens into the big general machine shop. A door behind the cashier's desk gives access to the manager's office, which wears a most cheerful air with its green and white finish in the natural wood, its generous brick fireplace and the bright, pleasing prospect from the four large windows.

The manager's office opens into the machine room, which occupies all the balance of the main floor. From this door is seen the vista of drill presses, heavy turning lathes, boring, grinding and milling machines shown in one of the photographs. In the left foreground of this view can be seen one of the heavy crankshafts of an Atlas truck extending outward from one of the lathes. In the right foreground is a stack of five flywheels and directly behind these are a number of clutch parts. On the floor in the background stand a number of engine cylinders.

The opposite side of this room is seen in the view looking toward the front of the building and showing two completed trucks, one on the large elevator, which gives access to the basement and the second floor. Back of the truck, to the right, in the center of the building, is the large stairway, with lower flights opening, one in the direction of the office and the other toward the rear of the shop.

On the second floor front is a large and amply lighted designing and drafting room, while over the machine room is the assembling and finishing shop.

Power for the machinery is furnished by a 90-horsepower stationary gas engine in the basement, and it is the purpose of the management to install a producer plant for the generation of fuel gas in the factory.

Two large sliding doors at the rear end of the main floor give on to a broad platform extending the full width of the building. From this platform raw material can be unloaded direct from cars standing on a switch track and completed trucks can be run on to cars for shipment either east or west.

A third sliding door at one side of the shop is designed to admit to a wing to be erected in the future, the plans as drawn contemplating a building in the form of a quadrangle 400 by 225 feet in outside dimensions and having an open court in the center. From the rate at which orders have been received for Atlas trucks and the interest shown in their performance in actual road work, the management of the company entertains the belief that the complete plan will take concrete form in the early future.

MACHINE DEPARTMENT ON SOUTH HALF OF MAIN FLOOR.

NORTH HALF, SHOWING ASSEMBLING DEPARTMENT AND ELEVATOR.

SMOOTH PAVING IN WILMINGTON.

The first asphalt and bitulithic pavement is being put down in Wilmington, Del. Several miles of street are being so paved and the work is nearing completion. In celebration of the innovation, there is a movement among automobilists here for a parade of cars over the newly-paved streets as soon as the work is finished and the streets are thrown open to the public. It is proposed to have a street parade, including an automobile contingent, followed by speechmaking, a dinner, vaudeville show and other features. The date will be selected later. Because of the hilliness of the streets, a great deal of Belgian block and firebrick paving has been laid in the past, but now the authorities propose using smooth material on level stretches. Between $50,000 and $100,000 has been spent on this work this year, and it is proposed to spend a like amount next year.

WOULD OUST TOLL COMPANIES.

A campaign whose successful outcome will mean the improvement of almost all the turnpikes in Baltimore county, Maryland, at an expenditure of more than $500,000, was started recently by a number of citizens backed, it is reported, by an influential body of men who, it is rumored, have agreed to stand all expenses of litigation that may arise from the project.

Most of the thoroughfares of the county are governed by turnpike companies, whose charters in some instances date back as far as 1804. In nearly every case the United Railways and Electric Company, which controls the entire system of electric car lines, is the chief stockholder in the turnpike concern, and it has neglected the roadbeds in favor of its railroad. The turnpikes total about 150 miles, and in one direction reach to the Pennsylvania state line. Travel on them is constant.

Proceedings have been instituted to compel the turnpike companies or the railroad company either to abandon the collection of tolls and abandon their charters, or to restore the roads to good condition. It is said that there is precedent in the case and that the company can be forced to turn over the roads to the county.

It is believed by many that the automobile had a great deal to do with bringing about this move on the part of the citizens. Last June there were more than 700 cars in the state. Now the total is nearly double that, and it is increasing rapidly.

It is commonly believed by non-technical persons that anything called "steel" must necessarily be stronger and better than iron. As a matter of fact, poor steel is miserable stuff, not to be compared with decent wrought iron, though the latter is a scarce material nowadays.

New Peerless Designs for 1906.

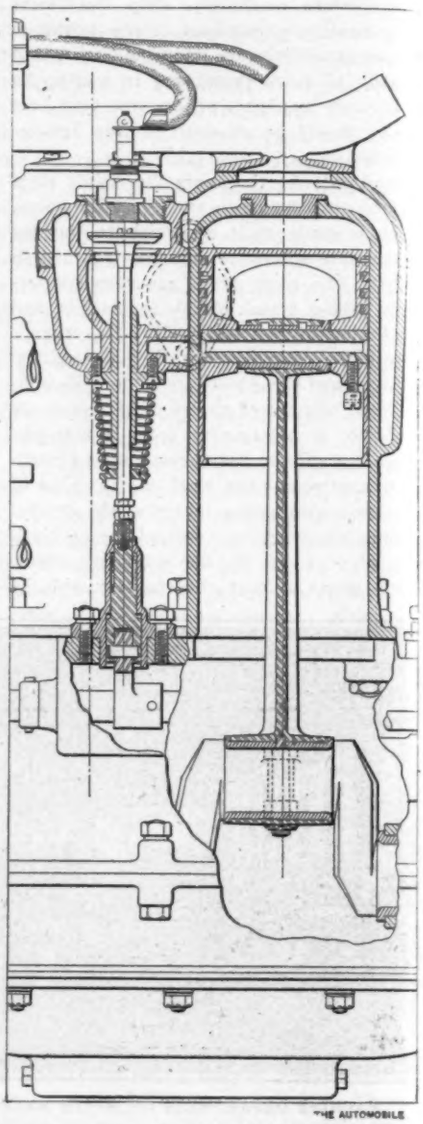
TWO cars, one of 30 horsepower and the other of 45 horsepower, will constitute the 1906 line placed on the market by the Peerless Motor Car Company, of Cleveland, O.; the 30-horsepower car will be known as Model 14 and the 45-horsepower car as Model 15. The 30-horsepower car is illustrated and described herewith.

The Peerless is a big, powerful and comfortable touring machine with four-cylinder motor, internal expanding clutch, four-speed sliding gear transmission and propeller shaft and bevel gear drive. The body is pleasing to the eye, being well proportioned, with a gracefully curved outline; and, what is of even more importance, it is roomy and the seats are wide and comfortably upholstered. The side doors, opening backward, are wide enough to permit easy passage into and out of the tonneau.

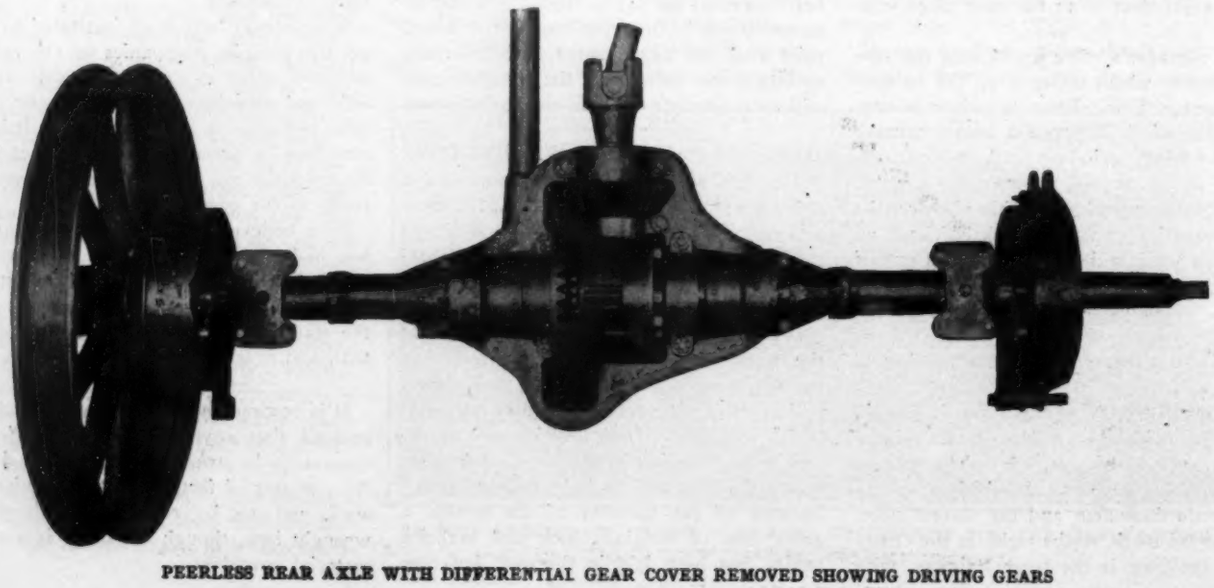
In the construction of the motor there are no departures from lines that have been well tried and are generally accepted as good sound practice; there is a marked absence of so-called "striking points" and there is a general appearance of having been built to work. The main features are made clear by the line engravings. Each pair of cylinders, with cylinder heads, water jackets, valve housings, is a single casting secured to the aluminum crankcase by studs, nuts and lock nuts; over a large opening in the top of the water jacket is secured the branch pipe carrying the cooling water from the radiator, the water circuit being completed by the gear-driven rotary pump and its pipe connections with the lower part of the water jacket and with the radiator. The valves, which are all alike and interchangeable and all mechanically operated, are symmetrically placed on opposite sides of the cylinders, the exhaust valves on the left and the inlet valves on the right; large plugs screwed into the valve housings at the top give ready access to the valves for inspection or grinding, a slot being cut in a projection on the valve head to receive the tool used to revolve the valve. The ports have an effective opening of 1 5-8 inches; the angle of the seating is 45 degrees. Spark plugs are screwed into the caps that close the openings over the inlet valves, where the sparking points are fanned by the incoming cool gas and are thus kept comparatively cool; being out of the way of the escaping exhaust, there is less chance of their becoming sooted. The valve stems work in long removable guides; the springs are held up by washers on the stems, a flat key in each stem holding the washer in position. The push rods are fitted with rollers to take the cam thrust. The pipe from the carbureter has two branches, one supplying the gas for each pair of cylinders — an arrangement that simplifies the piping considerably. The cylinder bore is 4 1-2 inches and the stroke 5 inches; the pistons are somewhat longer than the stroke, and each is fitted with four rings above the piston pin, the rings being split diagonally and fitted with pins to prevent turning in their grooves.

The piston pin is hollow and is prevented from turning by a steel screw with a plain tapered end; the screw is threaded through the boss in the piston and the tapered end fits a tapered hole in the pin. A split pin in the head of the screw prevents its working out. The connecting rods have big ends of the marine type, adjustable, and both ends are bushed with bronze. The piston-pin bearing is 2 1-2 inches long and 7-8 of an inch in diameter, and the big end or crankpin bearing is 2 7-8 inches long and 1 11-16 inches in diameter.

The crankshaft runs in three white bronze bearings suspended from the upper half of the horizontally divided crankcase.



VERTICAL SECTION OF ONE CYLINDER.



PEERLESS REAR AXLE WITH DIFFERENTIAL GEAR COVER REMOVED SHOWING DRIVING GEARS

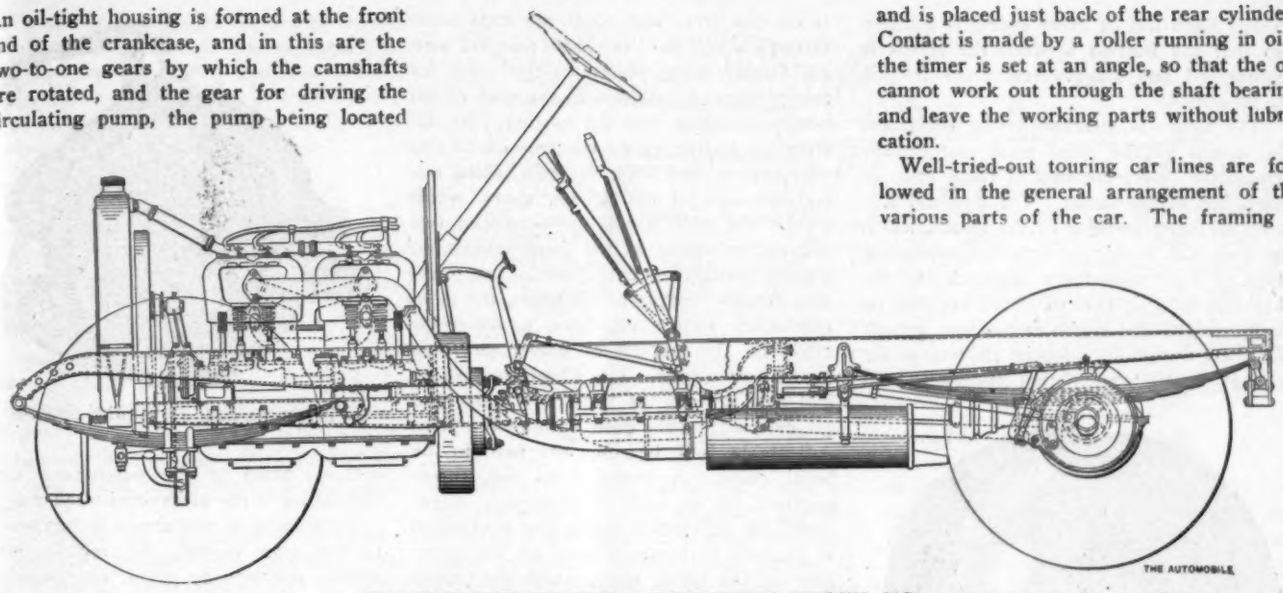
An oil-tight housing is formed at the front end of the crankcase, and in this are the two-to-one gears by which the camshafts are rotated, and the gear for driving the circulating pump, the pump being located between the pairs of cylinders on the right-hand side of the motor. The governor, working on the throttle, is on the gear on the inlet valve camshaft, and is also in the housing at the end of the crankcase. These important parts are thus not only thoroughly protected from accidental injury and exposure to dust and dirt, but are perfectly lubricated, running in oil. A plate on the front of the housing can be removed, exposing the gears and governor. Cylinders are oiled by force feed; lubrication of the crankpins, crankshaft bearings, camshafts and cams is by splash, oil being carried in the crankcase; a plug in the bottom of the crankcase catches all sediment, and when the plug is removed all the oid oil drains out through the opening, grooves being cut in the bottom of the crankcase to lead the oil to the hole.

Special care is taken to have the finish of working parts as accurate and smooth as possible. Cylinders are lapped after machining and reaming, and are finished all over inside, including the combustion chambers. The manufacturers state that this not only removes small projections that might overheat and cause pre-ignition, but also insures uniformity in the volume of gas taken into the cylinders. The bearings on the crankshaft are hardened and ground. Cranks and connecting rods can be reached by dropping the bottom of the crankcase without removing the dust pan which protects the motor from the dust of the road.

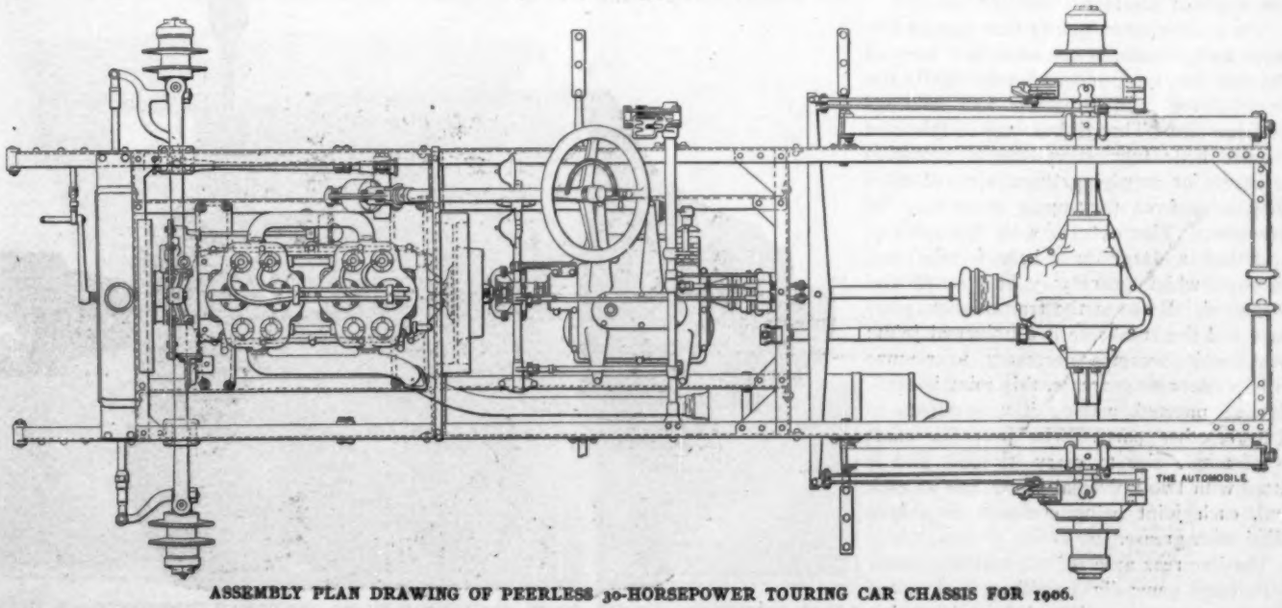
The carbureter is of the float feed type, automatic in its operation, and is heated by a water jacket; the throttle, operated by the governor, is of the butterfly pattern. Ignition is by jump spark, current being supplied by batteries; the timer is driven by bevel gears from one of the camshafts and is placed just back of the rear cylinder. Contact is made by a roller running in oil; the timer is set at an angle, so that the oil cannot work out through the shaft bearing and leave the working parts without lubrication.

Well-tried-out touring car lines are followed in the general arrangement of the various parts of the car. The framing is built up of pressed channel steel members; the sub-frame, carrying the motor and transmission gear case, is very long, extending from the front just back of the radiator to a point near the front ends of the rear springs. Large gusset plates are riveted into the corners to stiffen the structure. The longitudinal members are straight throughout their length—that is, there is no offset near the front; the frame is 148 inches long over all, inclusive of the curved spring hangers at the ends.

The spring suspension system comprises five semi-elliptic springs, two in front and three in the rear, the latter being arranged in platform style. Clips are placed on the springs to prevent breakage from rebounds on very rough roads. The side springs in the rear are placed as close to the wheels as possible in order to bring the load close to the hubs and minimize the strain on the



CHASSIS OF NEW PEERLESS 30-HORSEPOWER TOURING CAR.



ASSEMBLY PLAN DRAWING OF PEERLESS 30-HORSEPOWER TOURING CAR CHASSIS FOR 1906.

axle. Each leaf of every spring is polished so that the friction between the leaves is minimized and sluggishness from friction is prevented.

The motor is attached to the sub-frame by means of the usual arms cast on the crankcase; there are two of these arms at each end of the motor. The flywheel carries the outer member of the clutch, which in this car is of the internal expanding type. The advantages claimed by the builders for this type of clutch are that its light weight and slight momentum greatly facilitate the quick and quiet shifting of the change speed gears; that it takes hold

PEERLESS EXPANDING CLUTCH.

smoothly and progressively, without jerk or jar; that the wear is evenly distributed and automatically taken up; that there is no end thrust on the shaft; and that the clutch can be readily dismounted without disturbing other parts. The clutch pedal is long, affording great leverage, and means are provided for adjusting the distance between the pedal and the driver's seat, so that the driver, whether he be tall or short, can have the clutch pedal within comfortable reach of his foot.

The transmission, giving four speeds forward and reverse, is operated by a lever of the selective type, and both gear shafts run in imported, non-adjustable ball bearings of large size. Though bearings of this kind require little lubrication, special provision is made for supplying them with what oil they need from the supply carried in the gearcase. The case is split horizontally, and has a large hand-hole in the top, through which gears may be cleaned and inspected. Between the transmission gearcase and the crankcase is a universal joint; in case it becomes necessary to remove either motor or gearcase, this joint is readily disconnected, making it unnecessary to disturb other parts. The propeller shaft is of ample size to carry its load, and is fitted with two universal joints, one at each end, each joint being enclosed in a boot filled with grease.

The live rear axle is built on the customary lines, generally speaking, and is of strong construction. The differential casing is of cast iron, and to it the steel tubes through which the live shafts pass are bolted, flanges being brazed to the tubes for this purpose, in addition to the ends of the tubes extending into the casting. An interesting feature of the construction of this rear axle is that there are two joints, one on each side of the driving gears, which permit the rear wheels to be dished two degrees, the same as the front wheels, by slightly arching the entire axle. The joints also prevent binding of the gears, the manufacturers state, and have a noticeable effect on the amount of power delivered to the rear wheels. The wheels revolve on ball bearings on the stationary tubes and are driven from the outer ends of the hubs. Adjustable ball bearings are used in the bevel gears. A heavy truss rod, three-quarters of an inch in diameter, passes under the differential casing and is attached at its ends to bosses formed on the under sides of the spring seats, which are brazed to the tubes.

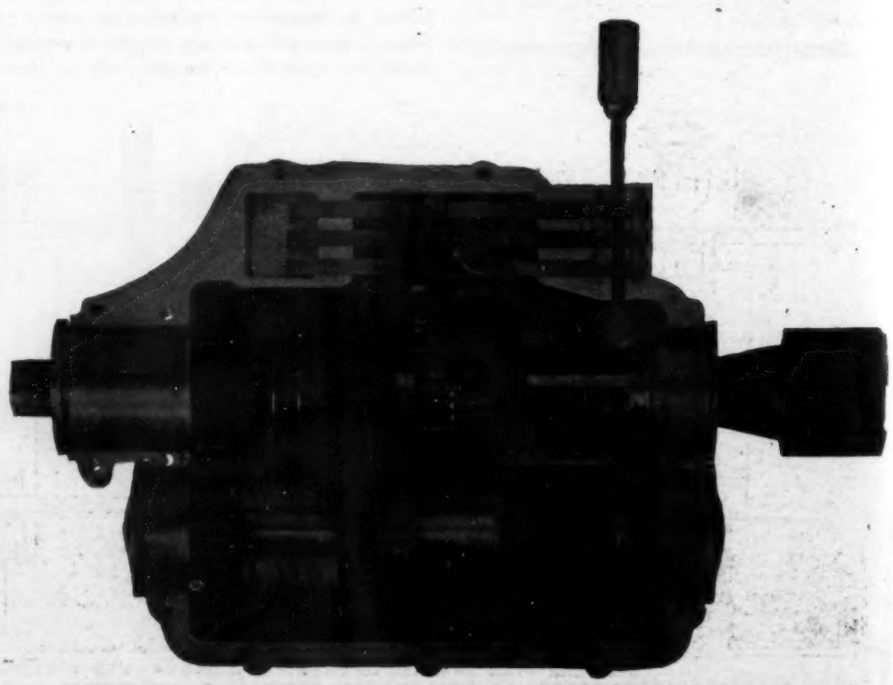
Steel of I-beam section is used for the front axle. The axle drops away from the steering knuckles at a sharp angle, runs horizontally for a few inches where the front springs are attached, and drops abruptly to the lowest point; a considerable length of the axle, in the center, is straight. This is the lowest part on the car. Elliott steering knuckles turn on ball bearings, and ball thrust bearings in the yokes take the weight and minimize the effort required to steer. The connecting rod between the steering knuckles is located in front of the axle; the joints are encased in boots containing lubricating grease.

Wheels are 34 inches in diameter, with dished spokes, and run on imported ball bearings, non-adjustable. Four-inch tires are fitted to all wheels; any American tire

INTERNAL AND EXTERNAL BRAKES.

will be fitted at the purchaser's option. Wheelbase is 107 inches and tread standard.

All braking is confined to drums attached to the rear wheels; the regular service brakes, operated by pedal, are constricting bands acting on the exterior surfaces of the drums, while internal expanding brakes, operated by a side lever, are used for emergency service; both are double acting. All the brake bands are lined with fiber and are fitted with springs which prevent contact with the drums when the brakes are released. In the Peerless car the engine can be used as a brake—a practice that is receiving much notice abroad at the present time. The foot brake does not withdraw the clutch, so that this brake can be applied while the engine is connected with the rear wheels through the clutch and transmission gears. Both brakes are provided with equalizers. The drums are of cast steel and are of large size. The finish will be the same as used on the 1905 Peerless cars—a dark, rich green, with striping of fine gold lines. Upholstering is done in a



SLIDING GEAR CHANGE SPEED, SHOWING SLIDING ARMS FOR MOVING YOKES.

fine grade of waterproof black leather and is soft and comfortable. The equipment of each car consists of two acetylene searchlights, two oil side lights and an oil tail light, an outfit of spare parts and the tools necessary for making adjustments.

Grout Gasoline Car.

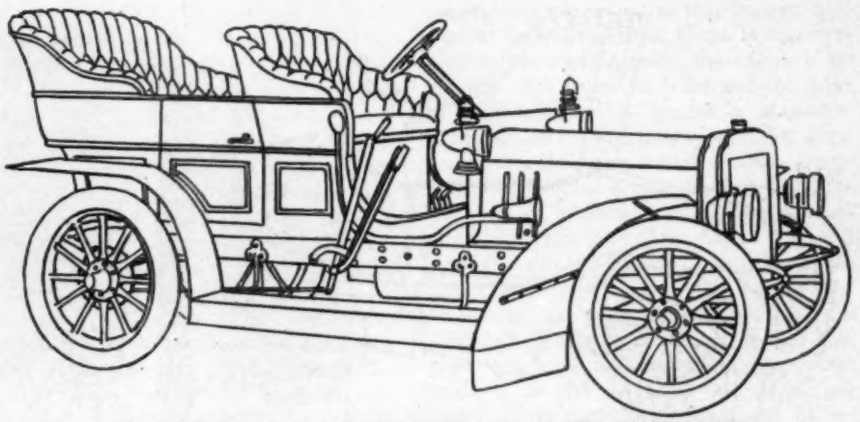
After building steam cars exclusively for a number of years, the Grout Bros. Automobile Co., of Orange, Mass., has branched into the manufacture of gasoline cars as well, the first car having appeared early in the past summer; it was illustrated at the time in these pages. The accompanying engraving shows the latest model, a four-cylinder, 28-30-horsepower, side-entrance touring car with sliding gear transmission and side chain drive, built on up-to-date lines.

The motor has separately cast cylinders, mechanically operated and interchangeable valves and is water cooled; the cylinders have a bore of 4 1-4 inches, and a stroke of 5 inches. The pistons are fitted with four rings each, and are lubricated by force feed. Crankshaft runs in five babbitted bronze bearings, there being three bearings between the main boxes at the ends of the crankcase. All bearings are attached to the upper half of the horizontally divided crankcase, so that the cranks and rods may be inspected by dropping the lower half of the case. Nickel steel forgings are used for the connecting rods; the wrist pins are hollow and are lubricated by splash from the crankcase. Gas is supplied by an automatic float-feed carbureter; ignition is by jump spark, with single coil and distributer. Water circulation is maintained by a gear pump driven from the camshaft.

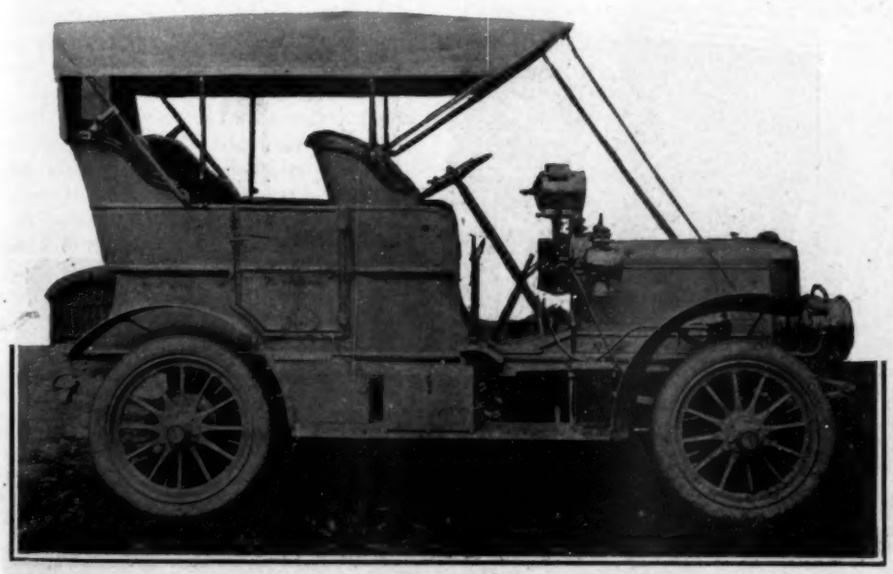
A cone clutch of the familiar type is controlled by a pedal, in the customary manner; it interlocks with both foot and lever brakes. The sliding gear transmission gives three speeds forward and one reverse, with direct drive on the high gear and no gears in mesh at any time except those that are actually working. The aluminum gearcase is oil tight and the shaft bearings are lubricated by splash, pockets being formed to catch the oil thrown up by the gears and carry it to the bearings; the shafts are hardened and ground.

Armored wood is used for the framing, and is well braced. The semi-elliptic springs, 42 inches long, are placed directly under the side members of the frame. Wheels are 30 inches in diameter and have 3 1-2 inch tires; large ball bearings are fitted. The wheelbase is 96 inches. Both front and rear axles are of three per cent. nickel steel of square section and solid; the rear axle is 1 1-2 inches and the front axle 1 3-8 inches square. Brakes consist of a band and drum on the countershaft operated by a pedal, and hub brakes connected to a side lever. Steering gear is of the worm and sector type, irreversible, and is inclosed in a dust-proof casing. Ignition and throttle levers on the top of the wheel are stationary, regardless of the turning of the steering wheel.

A force feed mechanical lubricator supplies oil to the main frictional points. Gasoline is carried in a seamless pressed steel tank under the front seat, the capacity being fifteen gallons. The manufacturers state that the consumption of gasoline is about one gallon for eleven miles running. Standard finish is Brewster green, yellow running gear, gold striping and dark green waterproof leather upholstering. The equipment consists of a horn, two oil side lamps and a set of tools.



NEW FORD MODEL K 40-HORSEPOWER SIX-CYLINDER TOURING CAR.

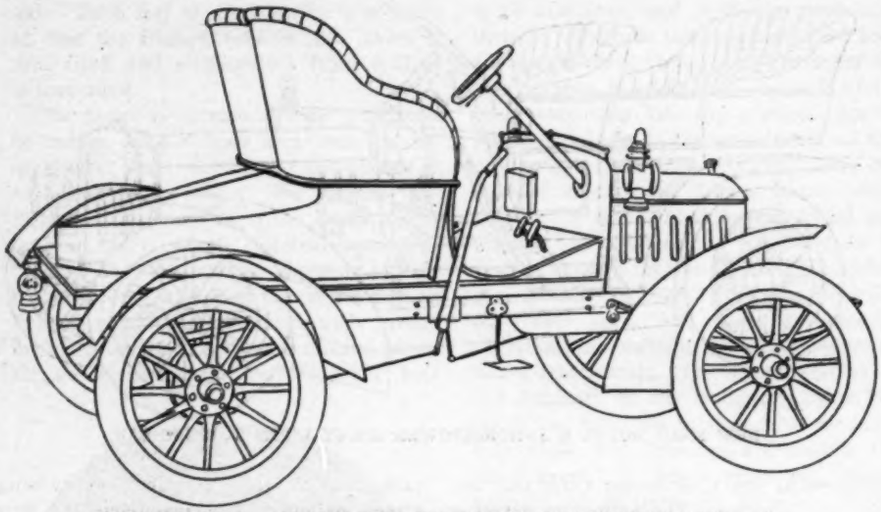


GROUT 28-30-HORSEPOWER GASOLINE CAR, WITH FOUR-CYLINDER ENGINE AND SLIDING GEARS.

Ford 1906 Models.

The line of Ford cars for 1906, as announced by an advance circular issued by the Ford Motor Company, of Detroit, Mich., will comprise three cars: a four-cylinder 15-horsepower runabout, a six-cylinder 40-horsepower touring car, and a light touring car with double-opposed cylinder motor of 4 1-2 inches bore and 4 inches stroke under the body. The three cars will be known as Model N, Model K and Model F, respectively; the light touring car, Model F, is already familiar to those who know the Ford products, while the other two are new.

Model N, the runabout, is built on attractive lines, having individual seats, sloping, round-ended rear deck and a neat hood over the engine. The motor has four vertical water-cooled cylinders with a bore of 3 5-8 inches and a stroke of 3 1-4 inches, and is rated at 15 horsepower; maximum speed, 40 miles an hour. Drive is through a planetary transmission and the Ford direct drive system, which, though the circular does not give any details of its construction, is presumably a propeller shaft and bevel gear drive similar to that used on the 1905 20-horsepower touring car. Roller bearings are used in the rear axle construction, while the thrust of the bevel gears is taken by balls; the front wheels run on ball bearings. Wheels are of wood, 28 inches in diameter, with 2 1-2-inch tires; wheelbase 78 inches and tread 56 inches. Lubrication is effected by a mechanical oiler and sufficient oil is carried for about 200 miles' running; the gasoline supply, ten gallons, is contained in a tank under the seat and is stated to be sufficient for the same distance. Steering is by wheel. Internal expanding brakes are fitted on the hubs of the rear wheels and are brought



FORD MODEL N 15-HORSEPOWER FOUR-CYLINDER RUNABOUT FOR 1906.

into action by a side lever; another brake, on the driving shaft, is controlled by a pedal. Full elliptic springs carry the body at the rear and semi-elliptic springs at the front. The finish is maroon. The equipment consists of two oil side lights, a tail light and a horn. The weight of the car is given as 700 pounds; thus the rated power of the engine gives, approximately, a horsepower for every 48 pounds' weight of the car. The price, which has not yet been definitely fixed, will be from $400 to $500.

Model K is a large touring car with side entrance body. It has a six-cylinder motor with cylinders of 4 1-2-inch bore and 4 1-4-inch stroke, and is rated at 40 horsepower; the maximum speed of the car is given as 50 miles an hour. A magneto furnishes the ignition current; water is circulated by a gear pump and a mechanical oiler is fitted. Fifteen gallons of gasoline are carried in a tank under the seat; gasoline and lubricating oil are calculated to carry the car about 250 miles on one filling of the tanks. As in the runabout, the drive is through planetary transmission and the Ford direct drive system; hub brakes are lever controlled and the shaft brake is set by a pedal. Roller bearings and ball thrusts are fitted to the rear axle and the front wheels run on balls. Wheels, 32 inches in diameter, with 4-inch tires; wheelbase 114 inches and tread 56 inches. Full-elliptic springs are placed in the rear and semi-elliptic springs in front. The car weighs 2,000 pounds, having a horsepower for each 50 pounds' weight. The price is $2,000. The equipment consists of oil side and tail lamps and horn.

Model F, with double-opposed cylinder motor under the body, will carry five passengers and weighs 1,400 pounds. The wheelbase is 84 inches and tread standard; wheels 30 inches in diameter with 3 1-2-inch tires. Maximum speed, 35 miles an hour. Gasoline capacity, 9 gallons; lubricating oil, 3 pints; water, 4 gallons. The car is finished in dark green with yellow running gear; the upholstering is in black leather, tufted.

Welch Pullman Limousine.

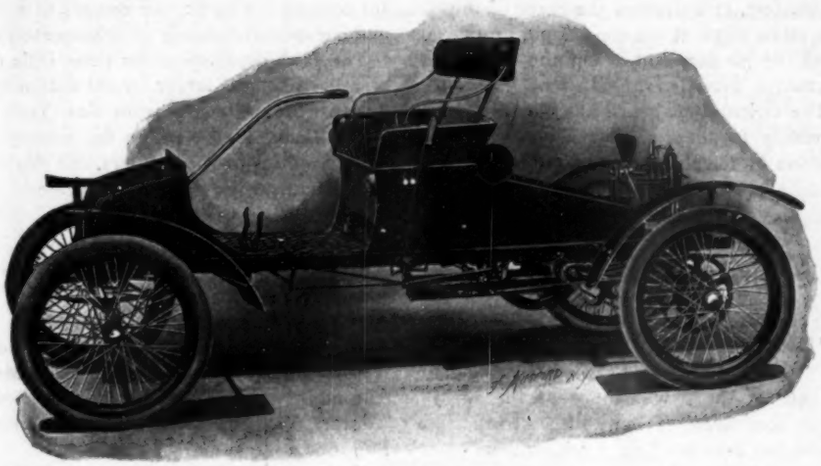
Of the Western cars for 1906 that have attracted attention in the East of late, one of the most imposing and luxurious is the Welch Pullman Limousine, built by the Welch Motor Car Company of Pontiac and Detroit, Mich. This has been exhibited privately in Philadelphia and Boston and is now being shown in New York at the new One Hundred and Twenty-fourth street garage of the Palace Automobile and Machine Company, in New York.

In general, the car follows the lines of the 1905 model. The chassis, which is of pressed steel with 114-inch wheelbase, is fitted with a 36-40-horsepower Welch engine having the four upright cylinders cast in pairs. The cylinder dimensions are 4 1-2 inches bore by 5 inches stroke. The inlet and exhaust valves in each cylinder are set directly in the dome-shaped head on opposite sides, and at an angle of 45 degrees from the vertical. The cam shaft to actuate them is set longitudinally above the center of the heads of the cylinders and operates the valves through rocker arms carrying rollers at their upper ends that rest upon the cams. The spark plugs are at one side of the inlet valves, and their points reach as nearly as possible the exact center of the compression space. Ignition current for the jump spark is obtained from wet cells. It is claimed by the builders that the absence of valve chambers and the position of the spark plug result in the quickest possible inflammation of the charge in the cylinder, as the flame spreads uniformly in all directions at once and the burning of the charge begins immediately over the head of the piston, instead of having to travel the length of a valve chamber, and across the piston head. Among the claimed advantages for this arrangement are that it results in perfect combustion of the charge and makes possible an extraordinary range of speeds for the engine. A special design of Holley carbureter supplies the gas mixture.

A novel change from last year's cars is the location of the circulating pump directly in the center of the radiator, on a shaft that extends through the radiator, and carries at its rear end the fan; the fan belt drives both the fan and the pump. This location of the pump provides an efficient circulation of the water directly in the radiator, which is of special Welch design and manufacture, and is divided internally into half a dozen sections so arranged that the water must circulate through all parts of the cooler before returning to the cylinder jackets.

Another unique feature of the Welch car is the telescoping steering column. The tubing to which the hand wheel is connected slides within the column proper, and has an internal expander that is tight-

WELCH 36-40-HORSEPOWER PULLMAN LIMOUSINE FOR 1906, WITH REMOVABLE TOP.



ORIENT BUCKBOARD FOR 1906, WITH FRICTION DRIVE, HOOD AND DUCK BACK.

ened by means of a large milled nut in the center of the steering wheel to be turned readily by hand. This telescoping feature not only permits the steering wheel to be pushed down to enable the driver to leave and enter his seat from the right side of the car, but also allows the length of the column to be adjusted exactly to suit the preference of any operator.

Drive is through a two-speed transmission with multiple disc clutches, and from the gear box to live rear axle by cardan shaft and bevel gears. The disc clutches are of alternate bronze and steel plates affording 263 square inches of friction surface. The change speed gearing is of such design that when driving direct on high speed the low speed gears do not revolve, although always in mesh. Entire control of the car is by means of one foot pedal for the clutch and wheel brakes, and one side lever for the two speeds and reverse. The brakes operating on the wheels are of large diameter with internal expanhing shoes and ratchet mechanism, enabling the wheels to be locked when the car is under speed. An emergency hand brake operates on a large drum on the driving shaft at the rear of the transmission case.

The cranks and gear shafts are of nickel steel. The connecting rods are drop forged and the crank pins are bushed with bronze and filled with babbitt lining provided with taper key and strap adjustment.

A positively driven multiple feed oiler feeds oil through one tube to the front propeller shaft bearing, whence the oil flows by gravity to the rear bearing and into the differential casing from which the entire rear axle is lubricated. Each feed to the engine, and that to the transmission, is forced by a separate pump that has neither springs nor valves.

Seven passengers can be carried in the closed portion of the Pullman limousine body, which is provided with permanent seats for the very comfortable accommodation of five adults. This body is in reality two bodies in one—an open double phaeton and a closed limousine. If it is not desired to remove the top altogether, the front glass over the dash can be drawn back and up against the roof over the driver's head, the window and its framing back of the front seats can be removed, and the windows and framing forming the upper halves of the doors can be taken off, making a semi-open body. The windows back of the front seat slide sidewise in their frames and the side and rear windows are hinged and provided with adjustable stops so that they can be opened to varying distances to afford complete ventilation. Each of the side doors has built on it a permanent cushioned seat facing inward. The entire top as well as the seats is upholstered in tufted morocco leather, while the front seats are cushioned in a more weatherproof quality of hand-buffed leather. The windows are of bevel plate glass set in mahogany sashes and curtained with satin. Provision is made for warming the interior of the body from a muffler.

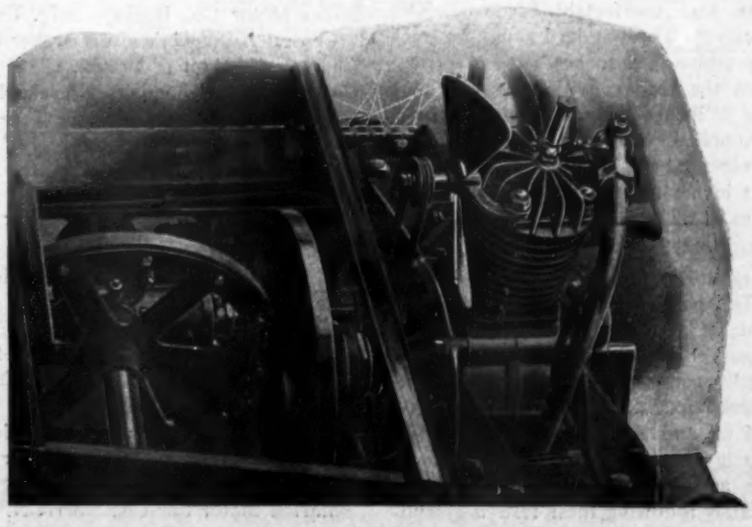
Besides the limousine car, there is also on exhibition in New York a special semi-racing or cross-country Welch car, the chassis of which is of the regular 36-40-horsepower model, with the exception that the rear portion of the pressed steel frame is narrower than in the regular model, the engine is set further back from the front and the drive is geared higher to permit a maximum speed of more than sixty miles an hour. Upon this chassis is mounted a low aluminum body having four individual seats, the rear pair of which are removable to permit the substitution of a turtle back. The rear springs, as in the regular chassis, are of the full elliptic type.

This car made the overland trip from the Michigan factory to New York in four days, over very bad roads and in rainy weather, arriving the day before the Vanderbilt cup race. It is not a regular model of the Welch line, but will be built upon special order if desired.

Improved Orient Buckboard.

Changes in the Orient Buckboard make the 1906 model a very different machine from the earlier models of this simple, light, low-priced road vehicle for two persons. While retaining the vertical single-cylinder air-cooled motor, located over the rear axle, the drive, instead of being by direct spur gearing, is by friction wheel and disc to a countershaft and thence by two side chains to the rear wheels. This arrangement provides a very flexible transmission through all speeds from zero to the maximum without gears, enabling the driver to suit his speed exactly to the conditions of travel and the power of the engine. It also results in the avoidance of any noise of meshing gears.

The engine is rated at 4 horsepower, but is said actually to develop 5 1-2 horsepower. The cylinder dimensions are 3 1-4-inch bore by 4 1-4-inch stroke. The friction disc occupies the position of the flywheel on the engine shaft and has a smooth metal face. The wheel which engages upon it is faced on the periphery with a special fibroid that has remarkable adhesive qualities. Pressure



POWER PLANT OF BUCKBOARD SHOWING ENGINE, FRICTION DISC AND WHEEL.

of this wheel against the disc is regulated by a ball thrust in the rear of the disc, which is operated by a left-foot pedal having a ratchet permitting of five different degrees of pressure.

The friction transmission permits of reverse motion at any desired speed up to the maximum forward speed, and is accomplished merely by shifting the friction wheel across the face of the disc to the opposite side. When the wheel is in the center of the disc it is in neutral position, but to prevent wear it can be moved back out of contact altogether. The position of the wheel with relation to the disc is regulated by a hand lever at the side of the car. The maximum speed of the buckboard, as regularly delivered, is thirty-five miles an hour, but special racing front sprockets can be supplied to increase the speed to more than forty miles an hour. A right-foot pedal actuates the brake.

Instead of being mounted directly upon the axle, as in earlier models, the engine in the 1906 buckboard is mounted on the rear of the frame, which is supported by four 19-inch full-elliptic springs on the axles. This reduces vibration to a minimum, and also increases the clearance of the machinery from the ground to ten inches instead of six. An Orient carburetter furnishes the gas mixture. Cooling is assisted by a four-blade fan mounted in front of the motor. A four-cell dry battery furnishes ignition current and a wipe contact Orient timer of French type regulates the sparking. Lubrication of the cylinder and bearings is by a sight-feed oiler operated from the seat.

A "duck back" covers the transmission machinery back of the seat and a hood and dash have been placed at the front, giving the machine a near approach to the form of the larger runabouts. The hood is a storage receptacle. There is also a light metal case beneath the machinery to protect it from dirt. Mud fenders are fitted above all wheels.

The weight of the car complete is 525 pounds. It has a wheelbase of 80 inches, and the seat comfortably accommodates two persons. The standard gauge or track of the machine is 42 inches, but for sections in which the road conditions require it, a tread of 56 inches—standard wagon tread—can be supplied. The body is of ash, natural finish, mounted on a truss frame. Axles are of 1-inch toughened steel. Wheels are 26 inches in diameter, fitted with 2 1-2-inch Goodrich single-tube tires.

The cylindrical gasoline tank at the back of the seat has a capacity of 3 1-2 gallons, sufficient for a run of about 100 miles. In recent tests this machine is asserted to have traversed 121 miles in 6 3-4 hours on a consumption of four gallons of fuel and 1 3-4 pints of oil and, on another day, was run 93 miles in 5 1-4 hours on three gallons of gasoline and one pint of lubricating oil. Immediately following these tests it ascended Old Boston Rock in Boston, an elevation of 562 feet, and climbed the flight of thirty-five stone steps at the top having an official grade of 32 per cent. On the reverse it climbed a grade of 22 per cent.

The Orient Buckboard has been designed especially to adapt it to rural mail service and use by telephone, telegraph and electric lighting companies, but is equally suitable for country use by private owners as a quick and inexpensive means of transportation.

The sales department for these little cars, as well as for the larger Orient automobiles, has just been removed from New York city to Waltham, Mass., where the factory and general offices of the builders, the Waltham Manufacturing Company, are located.

Allotments for A. C. A. Show in New York.

THE sixth annual automobile show of the Automobile Club of America, to be held at the new armory of the Sixty-ninth Regiment, Twenty-fifth street and Lexington avenue, New York, will be open for a week from January 13 to January 20. All space has been taken and cars of all types will be exhibited, as well as accessories and parts; the list of exhibitors shows that a number of foreign cars will be shown side by side with the American product. The total number of firms exhibiting is 204, of which 64 will be on the main floor, 89 in the galleries, 23 in the gymnasium and 28 in the basement.

A notable feature of the show will be the decorations. There will be no haphazard conglomeration of signs, such as is unavoidable without concerted action; but there will be a uniform scheme of coloring and arrangement, so that the general appearance of the hall will be harmonious and pleasing to the artistic eye. The effect will doubtless be all the more attractive on account of the absence of the crowding of exhibits that has marked the last two or three shows in the Madison Square Garden.

Following is the official list of the exhibitors:

MAIN FLOOR.

Acme Motor Car Co., George B. Adams, American Locomotive Co., American Motor Co., American Peugeot Automobile Co., Ardsley Motor Car Co., Aster Company, Austin Auto Co.

Baker Motor Vehicle Co., Bartholomew Company, E. W. Bliss Co., C. H. Blomstrom Motor Co., Buckeye Mfg. Co.

Central Automobile Co. (Archer & Co.), Charron Girardot & Voight, Class Journal Co. ("The Automobile"), Cleveland Motor Car Co., Corbin Motor Vehicle Corporation, Cryder & Co.

Daimler Manufacturing Co., Dayton Motor Car Co., Duryea Power Co.

E. H. V. Company.

Ford Motor Company.

E. B. Gallaher, Gobron-Brille (Henry F. Gotz), Grout Bros. Auto Co.

Hendee Mfg. Co.

Jackson Auto Co., Thos. B. Jeffery & Co.

Knox Motor Truck Co.

Lane Motor Vehicle Co., Lansden Co., Oscar Lear Automobile Co., Lozier Motor Co.

Marion Motor Car Co., Norris N. Mason, Maxwell-Briscoe Motor Co., Chas. E. Miller (Sundries), Mitchell Motor Car Co., Moline Auto Co., Moon Motor Car Co., Moore Automobile Co., Mors Automobile Co., "Motor Way" (Periodical), Motor World Pub. Co.

National Motor Vehicle Co., Napier Motor Co. of America, Newcomb Motor Co., Nordyke & Marmon Co.

Palmer & Christie, Palais de L'Automobile (H. Neubauer), Panhard & Levassor, Premier Motor Mfg. Co., A. J. Picard, Pungs-Finch Company.

St. Louis Motor Car Co., E. W. Sutphen (English Daimler).

The Rainier Co., Renault Freres Agency, Inc., Reo Motor Car Co.

Wayne Auto Co., Welch Motor Car Co., White Sewing Machine Company.

GALLERY.

American Ball Bearing Co., Aster Co., Aurora Automatic Machine Co., Auto Supply Co.

Badger Brass Manufacturing Co., Baldwin Chain and Manufacturing Co., Belding Automobile Trans. Co., S. F. Bowser & Co., Inc., Briscoe Manufacturing Co., W. H. Brown, Brown-Lipe Gear Co., Byrne Kingston & Co.

Connecticut Telephone & Electric Co., Inc., The Continental Caoutchouc Co., Continental Rubber Works Co., Cooks Ry. Appliance Co., William Cramp & Sons.

Dayton Electrical Manufacturing Co., Diamond Chain & Manufacturing Co., Diamond Rubber Co., R. E. Dietz & Co., Duff Manufacturing Co.

Eastern Carbon Works, Edison Storage Battery Co., Edmunds & Jones Manufacturing Co., Firestone Tire & Rubber Co., Fisk Rubber Co.

Gabriel Horn Mfg. Co., Gearless Trans. Co., B. F. Goodrich Co., Goodyear Tire & Rubber Co., G. & J. Tire Co., Gray & Davis.

R. E. Hardy Co., A. W. Harris Oil Co., Hartford Rubber Works Co., Hartford Suspension Co., Herz & Co., The Hess-Bright Mfg. Co., Hill Mfg Co., William Hjorth, "The Horseless Age," Hyatt Roller Bearing Co.

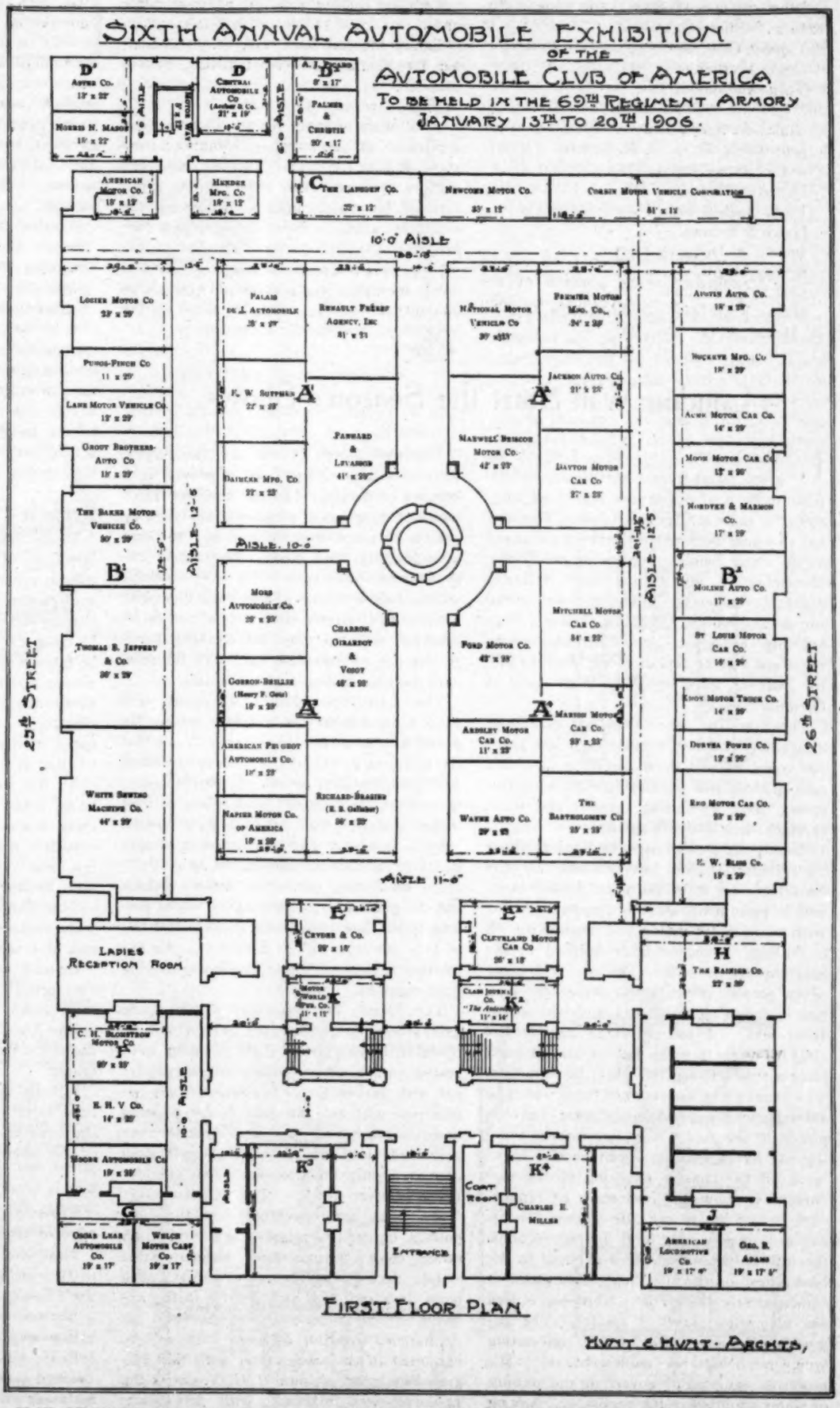
International A. & V. Tire Co., Iron Clad Mfg. Co.

Klean-Al Mfg. Co.

Light Mfg. & Foundry Co.

Manhattan Auto School, McCord & Co., McGiehan Odometer & Mfg. Co., Morgan & Wright, Motor Car Equipment Co.

National Carbon Co., N. Y. & N. J. Lubricant Co., N. Y. Sporting Goods Co.



PLAN OF MAIN FLOOR OF 69th REGIMENT ARMORY, NEW YORK, SHOWING ALLOTMENT OF SPACES FOR AUTOMOBILE CLUB OF AMERICA SHOW, JANUARY 13 to 20, 1906.

F. W. Ofeldt & Sons, Oliver Mfg. Co. Parish & Bingham Co., Penn. Rubber Co., Presto-Lite Co.

Ry. Appliance Co., Remy Electric Co., Republic Rubber Co., Rose Mfg. Co., Leon Rubay.

Saks & Co., Scandinavian Fur & Leather Co., Shelby Steel Tube Co., Sibley & Pitman, Spicer Universal Joint Mfg. Co., C. F. Splitdorf Co., Sprague Umbrella Co., Springfield Metal Body Co., Standard Roller Bearing Co., Standard Welding Co., Steel Ball Co.

Tinker Roller Bearing Axle Co., Trade Advertising & Pub. Co., Twentieth Century Mfg. Co.

Veeder Mfg. Co.

Warner Gear Co., Warner Instrument Co., Webb Co., Wheeler Mfg. Co., Whitlock Coil Pipe Co., Whitney Mfg. Co. Witherbee Igniter Co., Worcester Pressed Steel Co., Wray Pump & Register Co.

BASEMENT.

Autocar Equipment Co.

Rausch & Lang Carriage Co., Berkshire Automobile Co., British Westinghouse Elec. & Mfg. Co., Ltd.

Cantono Electric Tractor Co., Crawford Automobile Co.

Julian F. Denison, John Dolson & Son, Dorris Motor Car Co.

Iroquois Iron Works, Iroquois Motor Car Co.

Johnson Service Co., Jones-Corbin Motor Co.

Logan Construction Co.

McCrea Motor Truck Co., Mitchell Pneumatic Tire Co., Monarch Automobile Co.

Rapid Motor Vehicle Co.

St. Louis Car Co., Arthur J. Slade.

H. H. Thorp, Twombly Power Co., Twyford Motor Car Co.

Western Tool Works, Wolverine Auto. & Com. Vehicle Co.
Viqueot Company.
Oesar Werner.
York Automobile Co.

GYMNASIUM.

Anderson Spark Coil Co., Auto Lock Co.
John Boyle & Co., F. M. Brown.
Consolidated Rubber Tire Co.
Dac Auto Supply House.
F. A. Goebel, Gray-Hawley Mfg. Co.
Hatch & Brittan.
Judson & Downing.
Kinsey Mfg. Co.
Carl E. L. Lipman.
Mason Kipp Mfg. Co., Mills Mfg. Co., A. R. Mosler & Co., Post Mfg. Co.
Republic Rubber Tire Co., Francois Richard.
Safety Motor Power Co., St. John Rubber Tire Co., Sherwin-Williams Co., Survey Map Co.
Uncas Specialty Co.

Allotments of space for the Licensed Association of Automobile Manufacturers show at Madison Square Garden have been made with considerable difficulty, the applications for space greatly exceeding the available area. Other arrangements are progressing satisfactorily. The list of exhibitors will not be made public for several days, however, on account of the large amount of work necessary to wind up the business of making the allotments.

London Will Start the Season's Shows.

LONDON, Nov. 10.—The first of the great international automobile exhibitions to be held during the season of 1905-1906, the show at Olympia, London, England, has this year been timed to take place ahead of the Paris Salon, commencing on Friday, November 17, and lasting until Saturday night, November 25. Olympia is well suited for an automobile exhibition, being a huge building used for public entertainments requiring a great deal of room; Buffalo Bill, for instance, gave his Wild West show at Olympia.

There will be more than 300 exhibitors altogether, about fifty more than last year; 100 concerns will show complete cars, and among these will be fifty foreign manufacturers, some exhibiting directly and some through their British agents.

Among the British cars the Napier, whose six-cylinder engines are claimed by the manufacturers to be the most flexible built, will be prominent. A 40-horsepower chassis with six-cylinder motor will be shown with a Pullman limousine body finished in the most luxurious style. The car will carry seven persons, three in the wide rear seat, two in swiveling armchairs, and two on the front seat. A table, folding against the sides of the car when not in use, extends clear across between the seats; the windows, which can all be opened, are fitted with silk rolling curtains, and an electric light is placed in the roof. A 40-horsepower touring car has a body that can be slid backward off the chassis, exposing all the machinery to view for inspection or repairs.

A British steam car, the Turner-Miesse, has a flash generator built in four sections, the lowest section, which is exposed to the direct heat of the fire, being renewable at comparatively slight cost. Kerosene is used for fuel with excellent results. The engine has three cylinders of the single-acting type, requiring no stuffing-boxes. The power is regulated by governing the amount of water admitted to the generator. Among the exhibits at this stand will be a landaulet built on special order for an English peer.

The well-known Scotch car, the Argyll, built in Glasgow, has been improved in a number of details. The car has been fitted with ball bearings at all points; the steering gear is of a new pattern, as is also the rear axle housing, and many other minor improvements have been made. The exhibit will include a chassis of the latest type with four-cylinder engine with two of the cylinders cut away to show the working parts. A number of complete cars will be seen, with touring bodies and landaulets.

The Lanchester Motor Company will show a touring car and a landau seating six persons, the landau being remarkable for the width of its side doors. These cars have four-cylinder vertical motors with horizontal valves; the cylinders have a bore of four inches with a 3-inch stroke. Low-tension ignition is used. The lubrication is of special interest and the radiator is new.

An interesting car is the Dennis, which has the peculiarity of driving by worm pinion to the live rear axle. Several models of this machine will be exhibited. An exhibition chassis will have the worm-driving gear exposed.

The French De Dion cars will be quite extensively represented; the exhibit will include an 8-horsepower single-cylinder two-seated car, a 9-horsepower single-cylinder car with tonneau, a 12-horsepower two-cylinder car with side entrance double phaeton body, a 24-horsepower four-cylinder car with landaulet body, and a special exhibition chassis, highly finished, with four-cylinder 15-horsepower motor. The 15-horsepower chassis has been made no less than 300 pounds lighter than last year's model. A novel color scheme will dominate this stand; decorations and cars are all of a quiet dark red, rich and tasteful in the extreme.

Charron, Girardot & Voigt cars will be exhibited in the same stand with the Belgian Pipe cars. A new C. G. V. car is the 14-horsepower machine with live axle. These cars have engine and transmission gearcase suspended on the three-point principle, each having its individual suspension. Ignition is by high-tension magneto. A novelty in spring suspension, at least so far as modern automobiles are concerned, will be shown. This consists in the use of [illegible] springs, which, notwithstanding their unusual appearance, are said to have given excellent results in actual road work. The Pipe cars will be represented by a 28-horsepower limousine and a 50-horsepower chassis.

Charles Jarrott & Letts will exhibit De Dietrich cars, all finished in dark green. The cars include a new 15-20-horsepower car, a 16-horsepower landaulet, 24-horsepower limousine and 24-horsepower touring car. In the new models the valves are all on one side of the engine and are actuated by a single camshaft. Ignition is by low-tension magneto, and the sparking device is at the top instead of at the side. Gilled tubing is used for the radiator; all gear shafts run on ball bearings. Brakes are of the internal expanding type.

French Racing Cars for 1906.

PARIS, Nov. 10.—Although the Automobile Club of France has declared its intention of not encouraging racing next season, constructors are evidently not inclined to abstain entirely from speed tests. Hémery's Darracq car is being transformed and will be fitted with two motors of 100 horsepower similar to those in Hemery and Wagner's cars in the Vanderbilt race, and will, by this change, be made one of the most powerful speed machines ever built. It is intended to enter it for the Florida meeting.

At the Brasier factory experiments are being made with transmission gears, and there is a probability that a racing car with propeller shaft drive and motor similar to last year's Gordon Bennett racer will be built for 1906.

The Panhard firm has not yet decided what will be done next year, but there is talk of a 140-horsepower racer.

Renault and Hotchkiss are waiting, and very probably the latter will not construct a racer at all.

The De Dietrich firm will build a new racer, but particulars of it cannot yet be obtained.

A Léon Bollée racer will be seen on the road next season, M. Emile Stern having the intention of participating in two or three of the important events of 1906.

Didn't Want Stunts.

Prospective employer—"How close to the edge of that cliff can you drive at speed?"

First candidate for chauffeurship—"Within two inches, easy."

P. E.—"And you?"

Second candidate—"I have driven within half an inch."

P. E.—"And you?"

Third candidate.—"Sure, I would keep as far away as I could, if it cost me the job."

P. E.—"You're engaged."

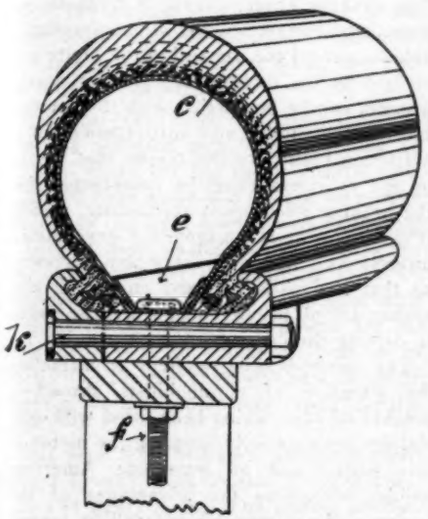
—Kansas City *Journal*.

Patents

Shock Absorber.

No. 803,589.—E. V. Hartford, of New York city.

The Hartford shock absorber, which is slightly modified from the "Truffault Suspension" by permitting a small amount of play of the springs before the friction device comes into action. The device consists essentially of two arms *11*, *12*, connected by an adjustable friction joint, and pivoted at their other ends to brackets or bolts attached to the frame and axle respectively. The friction joint consists of a pivot bolt *7* and nut, between which are clamped the friction discs *4*, *5*, with a leather disc between them. One arm *11* is



SANKEY TIRE AND RIM.

secured fast to its disc *5*, but the other plays between two lugs *13* *14* on disc *4*, and does not move the latter till the play is taken up.

Pneumatic Tire and Rim.

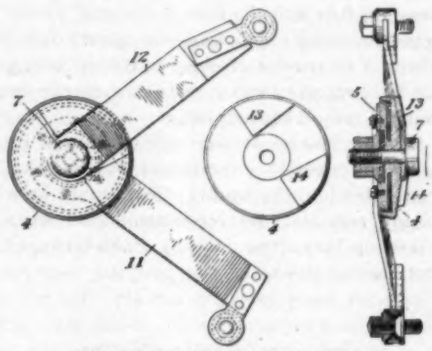
No. 803,510.—W. A. Sankey, of Sutton, Eng.

This invention consists of two parts—a split rim having one side removable by undoing the bolts *k*, for the purpose of replacing the tire, and the tire itself, which it is proposed to make air-tight by the pressure of the trough-shaped ring *e* against the edges of the shoe, no air tube being used. The shoe has a rubber lining *c*, and the trough *e* may be covered with rubber. No tire bolts are used, *f* being the valve.

Transmission Gear.

No. 803,845.—C. E. Neal, of New York city.

A transmission in which two gear ratios are obtained by the use of two sets of bevel gears and pinions on the rear axle, instead of by sliding spur gears as usual. The bevel gears are attached to the differential and are put in action by shifting both them and the bevel driving pinions. Reverse motion is obtained by another bevel gear placed to be rotated backward by the low-speed pinion. In the drawings, *13* *14* are the



HARTFORD SHOCK ABSORBER.

driving pinions, which are sleeved on shaft *10* and shifted by lever *20*, with which is incorporated a locking device actuated by an attachment *24* on the pedal *16*. The driven gears *5* and *6* for the low and high speeds forward, and *4* for the reverse, are connected to the differential *41* and shifted to the right or left by lever *35*, pivoted at *36*. The hand lever *27* shifts these gears to the neutral position shown, when a change of speed is to be made, and then the pinions are shifted forward or back and the gears brought into mesh with them.

Improved Magneto.

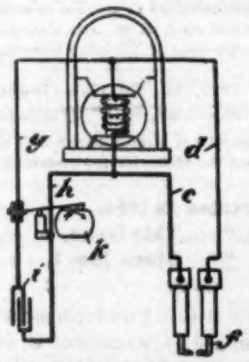
No. 802,291.—G. Honold, of Stuttgart, Germany.

A form of the Bosch magneto, in which the "H" armature revolves with no magnetic shield between itself and the pole pieces, and the spark is produced by the rupture of the armature circuit, which is closed without external resistance (*i.e.*, short-circuited) between impulses. While the armature is short-circuited, its self-induced magnetism is strong enough to divert the field lines of force from their natural direction through the armature core, and when the armature circuit is broken the sudden change in directions of these lines induces a momentary current in the armature winding, whose tension is sufficient to jump a fixed air gap. In the diagram, *g* *h* is the regular circuit, *k* the timer, *i* the condenser, and *c* *d* the path taken by the induced current through the spark plug *f*.

Carbureter.

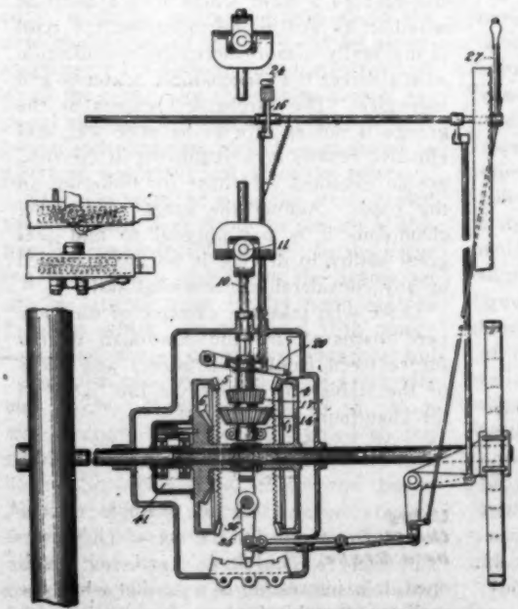
No. 804,025.—O. Minton, of New York city.

A carbureter having a float chamber (not shown) and adjustable inverted needle valve regulating the gasoline spray. There are two throttles, one at the level of the spray jet and the other at the top of the mixing chamber, and both throttles are constructed similarly, having each two slides, with partly overlapping circular holes, ar-

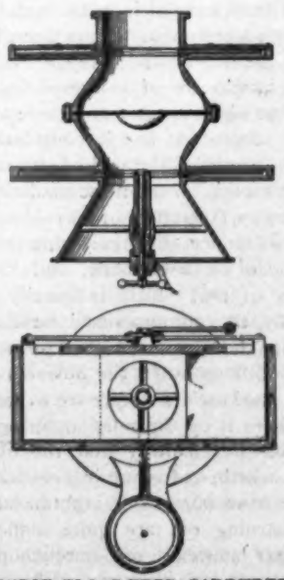


HONOLD MAGNETO DIAGRAM.

ranged to move simultaneously in opposite directions, so that the holes as they overlap constrict the aperture. The effect of this is to maintain the velocity of the air stream past the spray nozzle when the upper throttle is reduced.



NEAL TWO-SPEED BEVEL GEAR TRANSMISSION.



MINTON FLOAT-FEED CARBURETER.

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Use of Gas Lamps in Cities.

The recommendations of PRESIDENT D. H. MORRIS, of the Automobile Club of America, in his annual report regarding the use of acetylene gas lamps in city driving, will meet with the hearty approval of considerate autoists everywhere. The function of the gas lamp is to render night driving safe, not only for the automobilist, but for other road users. On country roads, when there is not bright moonlight, gas lamps are absolutely necessary if any speed faster than a crawl is to be made in safety. It is not merely that the surface of the road has to be illuminated; even more necessary is the disclosure of unlighted horse-drawn vehicles, which are met anywhere and everywhere after dark, and in considerable numbers in the neighborhood of cities. On dirt roads, especially, the noise made by a horse and buggy (the latter often rubber tired) in motion is not distinguishable to persons seated in an automobile, and the whereabouts of the vehicle is usually indicated only by the automobilists' headlights. In the city, however, the conditions are altogether different. In the business and residence sections the streets are so well lighted that there is no difficulty in seeing the surface of the roadway and the other road users, whether afoot or in vehicles. Under such circumstances side and tail lamps, usually burning oil, are quite sufficient. In fact, gas lamps are not merely superfluous; their use is a dangerous practice. The terrific glare from a set of lamps often temporarily blinds horses and their drivers, and is also apt to startle and confuse pedestrians on street crossings and cause accidents. Their unnecessary use certainly does not tend to promote good feeling between the man on foot and the man in the car. With gas-generating apparatus in good order, there is no trouble or delay in extinguishing or lighting gas lamps, so that they can be burned only when needed.

The influence of the club members by personal example will do much to bring this bad habit into disrepute, and it would be a happy result if the recommendation were taken up and acted upon by clubs throughout the country.

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Mechanician or Merely Driver?

What will be the ultimate status of the chauffeur is a question that thinking men in the ranks and outside have been considering a good deal of late. His duties, his place in the body social, and his remuneration—these are queries which are of great moment to thousands of drivers, whose number is every day increasing; yet who can read the future to answer correctly? Changes in the mechanical development of the automobile are more frequently discussed than changes in what may be termed the *personnel* of automobilism. And yet the changes in the latter are going on in a regular process of evolution, though they are not so immediately recognizable as the changes in steel and iron and wood construction.

From the earliest days of the popular use of the automobile the driver has been looked upon as a mechanician first and as a pilot of the vehicle afterward. Crudities and imperfections of the earlier machines made this necessary, for it was not so much a question of running the machine as getting it to run. More recently, however, the certainty of operation of the automobile has reached a point where it is a question whether its skillful operation on the road is not really a more necessary qualification of the driver than mechanical dexterity and ingenuity. The mechanical expert at the garage is not as rare as he once was, and effective repairs or adjustments in the shop are an excellent substitute for tinkering on the road. Among the great road-racing champions it is not unusual to find that great ability in driving is not accompanied by any considerable mechanical skill.

Those who take the extreme of the view here discussed see the coachman of the future freed from the drudgery and odors of the stable and dressed in the livery of the chauffeur.

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Using the Motor as a Brake.

As an example of the lines along which the automobile is being developed, it is interesting to note that while the earliest automobile brakes were applied with the utmost directness—to the rear tires—the latest practice is to brake from the point farthest removed from the tires by using the engine, with ignition cut out, as a brake. Practically every available intermediate part has been fitted with a brake at one time or another, including the clutch itself, the transmission shafts, the countershaft when side chain drive is used, the propeller shaft when the drive is by bevel gears, the differential gear, the hubs of the road wheels and the rims. An objection to which the engine-braking system is open is that the disablement of any part of the driving system renders the motor inoperative as a brake; the same objection is shared by other indirectly acting brakes, and is met by the hub brakes with which nearly all cars are now fitted for emergency use. There are certain advantages, however, to be obtained from engine braking that do not follow the use of friction brakes of the ordinary types. The braking effect obtainable from an engine fitted for such work, while abundantly able to control the car within the limits prescribed by the traction of the tires on the ground, cannot be applied with the jar that follows the sudden and hard application of a friction brake, for the reason that the air in the cylinders must be compressed and the braking effect must accumulate, rapidly if the low gear is engaged, but nevertheless progressively and with every step cushioned so that the loads imposed on the driving system are no heavier than when the motor is driving the car.

The motor-braking system is attracting the attention of automobilists abroad, a number of cars having been fitted with special devices especially adapting the motor to this work; and at least one American builder recognizes the advantages of the system and arranges his controlling system so that the motor can be used as a brake.

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Commenting on the speed of the cars that took part in the last Vanderbilt cup race, the *Railway Age* editorially denounces not only road and track racing, but all fast driving of automobiles, winding up with the suggestion that it might be a good idea to bar from the public roads all cars capable of running faster than a certain prescribed speed. The reason given for this view is the statement that "fifty persons were reported killed or injured by automobiles in the last six weeks in Chicago alone."

Reference to public statistics show that the *Railway Age* has, apparently, been indulging in a high-speed system of multiplication. It is shown by records in the Chicago bureau of statistics that during the first *six months* of 1905 there were only two persons killed and 39 injured by automobiles in that city, while in the same period no less than 533 persons were victims of horse accidents; of these 228 were run over or struck by teams.

If the automobile is to be limited to the speed of the horse, its usefulness is practically gone, and it has little excuse for existence, for its chief merit is that it can do more work than the horse, and do it better.

Expansion Continues in Cleveland Trade.

CLEVELAND, Nov. 20.—A number of changes are occurring in local retail circles preparatory to next season's business. A number of new companies have entered the field and there will be more competition than ever.

The Standard Automobile Company, recently incorporated, has succeeded to the business and establishment of the Automobile Garage & Repair Company, a leading retail concern which, for several years, has handled the Packard, the Autocar and the Cadillac. W. C. Anderson, who was with the company last year, is president, and George S. Waite, formerly with the Royal Motor Car Company, and before that manager of the local White branch, is vice-president and general manager of the new company. The garage on Huron street is one of the largest and best equipped in the country. It occupies a building 60 by 200 feet and four stories high.

Last year the Price Brothers Carriage Company occupied part of the building as the local agent for the Baker electric line, but it will soon move into a large four-story building of its own immediately adjoining the present store, so that the Standard Company will have the old building to itself. Manager Waite is fitting the top floor with complete machine shop equipment for all kinds of repairs to bodies as well as to chassis. In the basement will be a complete charging station and battery repair department.

This year the Ford cars will be handled from a branch store located at Euclid avenue and Perry street, thus adding another auto establishment to the several on that exclusive avenue. The branch will cover the territory embraced by northern Ohio and northern Pennsylvania.

The Energine Refining Company, with $500,000 capital stock, has succeeded the Energine Company, which for several years has manufactured the product known as Engerine, a substitute for gasoline. This product has met with a very pleasing reception, having been sold all over the country, and its makers have now interested additional capital and propose to push the product on a more extensive scale. A refinery capable of producing 700 barrels a day will be erected in Cleveland. The company intends to operate its own tank cars and to open branch storage and supply stations in twenty leading cities in this country. It will have its own wagons in these cities and will distribute the product thoroughly throughout the entire country. Branches are to be established in several large cities in foreign countries also.

The Royal Motor Car Company is preparing to move into a large addition to its plant. The building is 50 by 200 feet and two stories high, built of concrete blocks. The company is installing a great deal of new machinery, and the output of Royal Tourists next season will be more than double the number made this year.

Louis P. Mooers, formerly chief engineer of the Peerless Motor Car Company, has been in Cleveland recently, arranging to dispose of his interests in that company. Mr. Mooers is preparing to go into the manufacture of automobiles on his own account. He is not fully decided as to where he will locate, but it will probably be in the East. During the past four months he has been abroad, visiting a large number of foreign factories, studying the latest improvements in the art. He has prepared plans for several sizes and weights of machines, and says he will study the market very carefully before deciding what to build.

The Winton Company's branch is erecting a fine building more than double the size of the present structure on Huron street. When completed, there will be four big automobile establishments in a row, all of them four-story buildings.

MEETING OF OLDS AGENTS.

Nearly 150 Are Entertained at Factory and Inspect New Models.

LANSING, MICH., Nov. 18.—About 150 Oldsmobile agents arrived in Lansing yesterday from all parts of the country to attend the two days' meeting arranged by the Olds Motor Works for the purpose of giving the agents an opportunity of inspecting simultaneously the new Olds models for 1906, to renew acquaintances and to discuss business prospects and methods.

All the 'busses, touring cars and runabouts in use about the factory were pressed into the service of conveying the visitors to the hotel for breakfast. Then the guests of the company were taken to the factory, where Chief Engineer Coffin, of the company, made an interesting talk about the new models, which was followed by an inspection of the factory and demonstrations of all the models for the coming season, especial attention being given to the two-cycle two-cylinder machine, which is expected to prove an important feature of the season.

Saturday morning a special train hauled the visitors to Ann Arbor to see the Michigan-Wisconsin football game. In the evening there was a banquet to the agents set in the largest room in the main factory building, which was decorated with pumpkins, hay, straw, cornstalks, squashes and other farm products symbolic of prosperity and plenty. Down one side of the room was arranged a row of red-lighted booths, giving the place the aspect of a country fair. Two long tables were set for the diners. At one end of the room a stage was erected, from which orchestral music was rendered during the supper, and later a vaudeville troup from Chicago gave an entertainment, in which a number of songs and parodies in which the Oldsmobile figured prominently were sung.

Every effort was made by the officers of the company to make the occasion both unique and memorable, and in this they succeeded admirably.

PHILADELPHIA COMBINATION

Auto Dealers' Rival Associations Amalgamate into One Strong Organization.

PHILADELPHIA, Nov. 20.—At the Hotel Hanover, this evening, there was held a joint meeting of the two rival associations of dealers in automobiles and accessories, at which nearly every local representative of the trade was present. The object of the meeting was the amalgamation of all branches of the trade here into one active organization with the object of keeping automobiling before the public by every legitimate means—such as race meets, shows, economy runs and hill climbs. The name Philadelphia Automobile Trade Association is to be retained.

The program as outlined was carried out to the letter, the dealers in accessories being admitted on an associate basis, but paying the same amount of dues as the members actually engaged in the selling of automobiles.

The election of new officers was postponed till the regular annual meeting, which is scheduled for Saturday evening, December 2.

It was decided, among other things, to hold the next show in the National Export Exposition Building, at Thirty-second and South streets, in west Philadelphia.

NOT TO BUILD AUTOS.

Officer of Smith Typewriter Company in Syracuse Denies Report

SYRACUSE, Nov. 20.—Announcements have been circulating among newspapers throughout the country to the effect that the Smith Premier Typewriter Company, of which Timothy L. Woodruff is president, was preparing to manufacture automobiles. There have been two versions of the report; one was that the sale of typewriters was to be given up in favor of the manufacture of autos, and the other that the company would continue manufacturing typewriters, and, in addition, would build automobiles in its former factory in this city, which was abandoned for a model new plant.

William Allan Dyer, secretary and treasurer of the company, when seen by a correspondent of THE AUTOMOBILE at his office, declared with emphasis that there was no foundation for the report.

"I don't know how it started," said he, "but I do know one thing, and that is that we are not making any plans to build automobiles."

Mr. Dyer said that his company had not leased any of its property, so far as he

knew, to any person who would engage in the automobile industry.

More than ordinary interest was taken in the rumor here, because Alexander T. Brown, vice-president of the Smith Premier company, is also president of the H. H. Franklin Manufacturing Company.

FINE NEW GARAGE FOR TOLEDO.

TOLEDO, Nov. 20.—A number of prominent automobile owners of this city have organized a company with the object of erecting and maintaining a large, modern garage in the residence part of the city. Plans are being drawn by a local architect for an establishment that is to be the finest garage in northwestern Ohio, if not the best in the state. They will call for a structure costing upwards of $50,000.

There has long been need for such a garage. The important ones here are at present located in the business section and are too far from the residential section to please the promoters of the new enterprise. Neither are they large enough to afford all the accommodations those interested desire. It is understood that A. A. Atwood, at present in charge of the Weed garage, will be manager, but as yet nothing definite has been announced.

There is also some talk of providing club rooms in the new building, but this is uncertain as yet. There is need for club rooms, as there are none at present and the Toledo Automobile Club has almost disintegrated on this account.

NO CHAIN MAKERS COMBINE

President C. E. Whitney, of the Whitney Manufacturing Company, asserts that there is no truth in the rumor of a probable combination of chain manufacturers which grew out of the recent meeting of chain makers in Chicago. "For some time we have been trying to work in harmony with our competitors for the benefit of automobile manufacturers, dealers, jobbers and users," he says, "and many conditions have been improved by the plan during the past two years. We have no idea of connecting our business with any combination, and therefore wish to correct any false impression which may have been given."

Arrangements are already in progress for the fourth annual automobile tournament on the Ormond-Daytona beach. "Senator." Morgan recently made a trip to Florida on business connected with the meet, and among other things will arrange for the stringing of twenty miles of double wiring for the timing apparatus, the wiring used during the past two meets being in bad condition. The expense will be divided between the local telephone company and the F. E. C. A. A. Mr. Morgan also visited Jacksonville to confer with the directors of the Pure Food exposition, to be held in Jacksonville, January 4 to 18, about an automobile exhibit that is to be held in connection with the main show.

A. C. A. Annual Meeting.

A number of important suggestions were made by President Dave H. Morris, of the Automobile Club of America, in presenting his annual report at the regular annual meeting of the club on Monday evening, November 20. Mr. Morris pointed out that, while there were about a thousand automobiles owned by members of the club, the club garage now in course of construction will provide accommodation for only 350 machines; and in order to take care of a greater number of cars than the main garage could contain, the plan of establishing garages in other parts of the city was suggested. Garages might be located on the east side, in the downtown district, on Long Island, in Westchester county and in New Jersey, so that members residing at a distance from club headquarters could be taken care of.

Mr. Morris suggested the establishment of a touring department for the purpose of supplying information to members who contemplated touring in this country or abroad. He referred to the danger attendant upon the use of searchlights in the city streets, and suggested that members do all in their power to suppress the practice, beginning by setting the example themselves. He called attention to the unnecessary amount of smoke, with its strong and unpleasant odor, emitted by many cars in the streets, and asked the members to do what they could to prevent the nuisance; and he also urged them to refrain from the use of sirens.

The report showed that much delay has been experienced in the work on the new club house on account of quicksands and water. Work is now proceeding rapidly, however, and it is hoped that early spring will see the club established in its new home.

Reference was made to the work of the club in securing for automobilists the privilege of running their cars on and off ferry boats under their own power; also to the successful second year of the New York Y. M. C. A. automobile school, which, the president said, is turning out good, reliable chauffeurs, and warrants the support of the club; to the work of the club in seeking to prevent accidents due to the infringement of speed ordinances and the carelessness and recklessness of chauffeurs; and to the fact that good work had been done in stationing guards along the main highways used by automobiles to warn the careless or unwary against overspeeding.

The Law Committee, the president stated, has been active. A book has been compiled containing all the automobile laws of all the states and territories; a bill has been drafted for a national law; arrangements have been made to furnish special counsel at nominal cost for automobilists who may be arrested, and also to furnish bail in such cases as may require it.

Officers were elected according to the regular ticket, the list being as follows: President, Dave H. Morris; first vice-president, Colgate Hoyt; second vice-president, Frederick G. Bourne; third vice-president, General George Moore Smith; treasurer, W. S. Fanshawe; governors—to serve three years, Colonel John Jacob Astor, George F. Chamberlin and Schuyler Skaats Wheeler; to serve one year, John E. Borne; to serve two years, William Pierson Hamilton.

NEW CLUB ROOMS OPENED.

Washington A. C. Members and Guests Assemble to Inspect New Quarters.

WASHINGTON, D. C., Nov. 20.—The Automobile Club of Washington opened its new club rooms in the Colonial Hotel Saturday night with a smoker, which was attended by several hundred members and guests. For several weeks a committee has been working hard fitting up the rooms, and that their work was well done was evident from the many congratulations showered upon President Duvall, Secretary Marks and the other members of the committee.

The rooms are on the second floor of the Fifteenth street side of the hotel and are reached by a short flight of steps. The hangings are of green silk and the furniture of mission style, while upon the walls are hung a number of beautiful pictures, including several photograph enlargements of interesting automobile events like the Vanderbilt Cup Race and last year's Ormond meet.

After the hand of good-fellowship had been extended, President Duvall made a short address, calling attention to the enthusiasm with which the club idea had been received and pointing out what had been accomplished by the club in the brief period of two months. He asked for the support of the members in the movement undertaken by the club to correct some abuses to which the automobilists of Washington were constantly subjected. Mr. Duvall was followed by Captain Caverly, who urged the members to turn out in full force on all club runs, assuring them that he would map out a number of interesting runs.

The A. C. of Washington is growing rapidly, and now that the 100 mark has been passed, strong efforts are being made to bring the membership up to 200.

SYRACUSE CLUB SMOKER.

SYRACUSE, Nov. 20.—The Automobile Club of Syracuse held a smoker at the Yates Hotel last Saturday night, a buffet lunch being served and a musical entertainment given. This was the first meeting since June and was well attended.

President W. L. Brown was empowered to appoint a committee of five to arrange for the annual banquet, which will be held in January. It is expected that some prominent members of the A. A. A. will be present. The club decided to erect danger signs on the roads next spring. The membership is now about 125.

Twenty-four-hour Record Broken at Indianapolis.

INDIANAPOLIS, Nov. 18.—In a twenty-four-hour race that ended here at 2.45 o'clock yesterday afternoon records from 650 miles to 1,000 miles were broken by a National car driven alternately by F. W. Clemens and Charles Merz, the latter a seventeen-year-old boy. The race was under the auspices of the Indianapolis Automobile Racing Association and was held on the track at the Indiana State Fair Grounds.

When the big car, a 40-horsepower stripped stock car, pulled up at the end of twenty-four hours 1,094 3-16 miles had been covered, breaking previous records by 78 9-16 miles. The time for 1,000 miles was 21 hours 58 minutes and 4-5 seconds, breaking Vaughn's record by 1:32:19 1-5. Times for intermediate distances were as follows:

Six hundred fifty miles, 14:08:51 2-5; 700 miles, 15:10:29 3-5; 750 miles, 16:20:25 1-5; 800 miles, 17:17:26 1-5; 850 miles, 18:23:44 2-5; 900 miles, 19:44:48 1-5; 950 miles, 20:54:50 3-5.

The average speed was 45 7-12 miles an hour and the best mile was made in 1:02 3-5.

The race started with Merz and Clemens both driving National cars, and both continued in the race until the 152nd mile, when, owing to the gas lamps not all being lighted, Clemens' car crashed through a fence. Clemens escaped without a scratch, but the car was damaged. Clemens, however, was in the winning car with Merz when it finished.

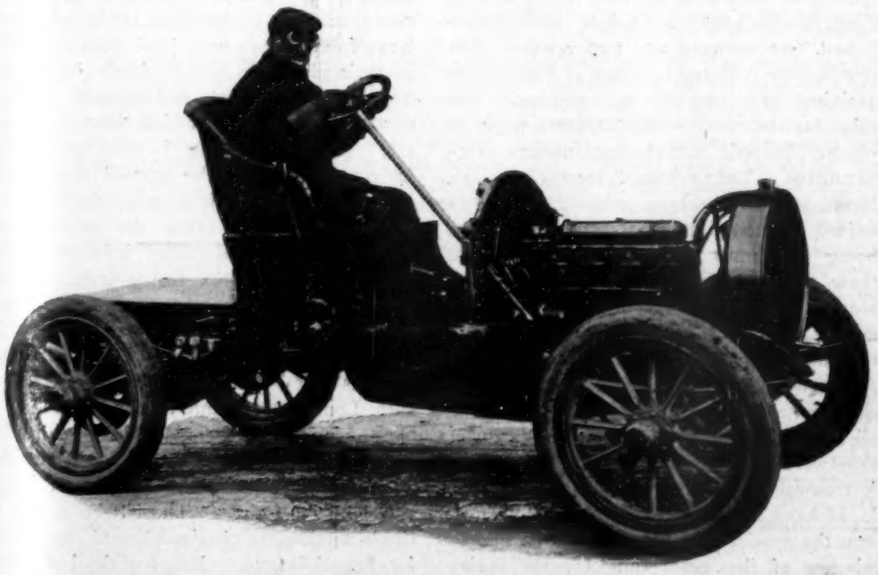
During the night the track was lighted by Presto-O-Lite gas tanks placed at twenty-five-foot intervals around the track. The night was very cold and icy blasts from the north caught the drivers on every lap. At times they were so numbed by the cold that they had to almost be lifted from the machines and carried into the judges' stand, where they sometimes had to be rolled on the floor before they could get control of the muscles of their limbs. The greatest pain they suffered was from cold to their eyes, as during the night it was impossible to wear goggles because frost would form on the lenses.

After the accident to Clemens' car it was decided that the two men should drive the other car alternately, each man driving about 100 miles at a stretch.

The most remarkable feature of the race meet held in Indianapolis on November 4 was the uniform running of the two National touring cars in the 100-mile race. It was nip and tuck between these two cars for first position through the first eighty-four miles, first one, then the other, being a few yards in the lead. In the eighty-fourth mile both cars were flagged, so that one of them could be stopped to have new tires put on. In the ninety-fifth mile one of the fresh tires burst, putting the car out of the race. The other, driven by "Jap" Clemens, won the race in the record time of 1:53:21 for the 100 miles.

With the exception of the first mile and the one in which it was flagged, this car made all of the mile circuits in from 1 m. 5 1-5 s. to 1 m. 10 s., representing a variation of less than five seconds to the mile in 100 miles. Sixty-one of the laps were made in 1 m. 8 s. or less. The principal intermediate times were as follows: Ten miles, 11:31 3-5; twenty, 22:48 2-5; twenty-five, 28:28 2-5; thirty, 34:08; forty, 45:28 3-5; fifty, 56:48 3-5; sixty, 1:08:12 2-5; seventy, 1:19:33 2-5; seventy-five, 1:25:13 1-5; eighty, 1:30:46 1-5; ninety, 1:42:14 one hundred, 1:53:21 4-5.

Both cars were strictly stock machines, stripped, and at no time up to the eighty-fourth mile was there more than fifty feet separating them. The time for the 100 miles is believed to be a record for stock cars in competition on the track.



F. W. CLEMENS IN DUPLICATE OF STOCK NATIONAL TOURING CAR THAT BROKE 24-HOUR RECORD AT INDIANAPOLIS LAST SATURDAY.

SPECIAL TRAIN FOR FLORIDA MEET.

MINNEAPOLIS, Nov. 20.—The Minneapolis A. C. is making arrangements for a special train to take its members to the Florida beach races. The train will leave Minneapolis January 19, and the members of the club will carry with them the trophy which is to be presented to the Florida East Coast Automobile Association. The presentation is to be made in honor of Asa Paine, of Minneapolis, now president of the Florida club.

It is expected that fully 100 Minneapolitans will make the journey, and special rates have already been secured. The train will consist of ten coaches, including all requirements for making a pleasant trip. The train will reach Daytona on Monday of the meet week, will be sidetracked and be used as dining and sleeping quarters of the party during the entire tournament. The return trip will commence on Saturday. Points of historic interest along the route are to be visited on the return, and an opportunity will also be afforded members of the party to visit the Chicago automobile show. The schedule provides for the train reaching Minneapolis January 30. As low a rate as $86 for the trip, including berth and meals, has been provided.

THANKSGIVING DAY RACE MEET

BALTIMORE, Nov. 20.—An automobile and motorcycle race meet will be held at Electric Park, in the suburbs of this city, on Thanksgiving Day, under the management of Howard A. French. It is expected that entries will be received both from Washington and Philadelphia, and that a larger number of cars than usual will participate in the various events.

"Chic" Thomas, a young cyclist of this city, is negotiating with the Hendee Manufacturing Company for the two-cylinder 3-horsepower motorcycle which made the one mile record at Charles River track, Boston, on Labor Day. Thomas is after the state five-mile record, at present held by Charles Callahan.

The program will include lightweight and middleweight automobile handicaps, a horsepower handicap race, a five-mile automobile open, and several motorcycle races.

SCHOOL BOARD FAVORS AUTOS.

TOLEDO, Nov. 20.—The Toledo Board of Education has adopted the automobile as the official vehicle of the board. This body makes frequent trips of inspection to the school buildings throughout the city, and after having once used an automobile, all other means of conveyance are eschewed.

Even George McKesson, business manager for the board, is partial to the automobile as a means of getting about. He uses a motorcycle all the while, except

when he takes the other members about. "I do not see how I could get along without a machine of this kind," he said recently. "I go over the city several times a week and, next to an automobile, I do not believe that there is anything that would enable me to get so much work done as a motorcycle."

TRANSCONTINENTALISTS IN 'FRISCO.

Percy Megargel and David Fassett arrived in San Francisco in the *Mountaineer* the latter part of last week, according to a telegram received last Friday at the Lansing factory of the Reo company. Both the overlanders are in good trim and are now on their homeward journey. Unless the snow is found too deep in the Sierra Nevada and Rocky Mountain ranges, the most difficult part of the first round trip by automobile from New York to San Francisco and back will soon be accomplished.

Instead of attempting to drive his machine down the coast to San Francisco, which, at this time of the year, would have meant a considerable delay, Megargel shipped the *Mountaineer* on the regular California steamer last Sunday. He will drive from San Francisco to Los Angeles, and from that place will follow the Santa Fe route east. The tourists expect to reach New York on the return trip about the middle of January.

HIGHWAY TRAVEL IN THE ARID REGIONS OF THE NORTHWEST AS SEEN BY MEGARGEL AND FASSETT.

CHICAGO CLUB COMMITTEES NAMED.

CHICAGO, Nov. 20.—A meeting of the newly elected directors of the Chicago Automobile Club was held last week and a vigorous policy for adding to the membership was outlined and discussed at length. At present the club has more than 500 members. It was also decided to appoint a committee for the purpose of looking over desirable locations for a new club house. President Farson made the statement that as soon as a site can be secured the club can raise $60,000 for erecting a building. It was also decided to elect a committee to erect road signs beyond the city limits within a radius of twenty miles.

Committees have been appointed for the coming year, some of the leading automobilists in the city being named as chairmen. The list follows: House, Robert Tarrant, Jr.; Membership, Allen S. Ray; New Club House, Ira M. Cobe; Racing, Jerome A. Ellis; Runs and Tours, Charles E. Gregory; Legislation, Sidney S. Gorham; Auditing, W. G. Lloyd; Country Crossroads Signs, T. J. Hyman; Good Roads, John Farson.

President Farson is trying to stir up enthusiasm among the members to make the trip to Ormond, Fla., for the races. It is very probable that a number of Chicago automobilists will make the trip, probably joining the Minneapolis delegation in their special train.

MOTOR CYCLISTS' REGULARITY RUN.

The regularity and judgment run of the New York Motorcycle Club, postponed from November 7, on account of muddy roads, was held on Sunday, November 12, the route passing through Mount Vernon, White Plains and Tuckahoe to Bedford, and returning to New York, the total distance being ninety miles. The road, part of which is new state highway, is good and rather hilly; though a picturesque route, it is not very much used by automobilists. The rules of the contest made it necessary to cover the distance at an average speed of fifteen miles an hour; in order to prevent loafing or scorching to make up or use up time, secret checking points were established, two outward and two inward. Entrants were required to check at Bedford on arriving and on leaving; luncheon was taken at this stop. Speedometers were, of course, barred, though cyclometers were permitted. Ten minutes' leeway was allowed at each checking point—five minutes before or five minutes after the exact time being the limits. Riders keeping within these limits were credited with perfect scores; one point was deducted for each minute more or less than the limit allowed, records being kept at all checking places. A special prize was offered for the rider coming nearest to the exact schedule, while all coming within 75 per cent. of the exact time were to receive individual prizes. Perfect scores were made by R. H. Bartsch, T. J. McLoughlin and A. Kreuder; Bartsch won the special prize, coming within eleven minutes of the exact time for the entire run. S. J. Jenkins, R. H. Nickerson, T. W. Horenburger, M. Toepel and M. Thompson qualified for the individual prizes, making scores of from 82 per cent. upward.

BLUE BOOK FOR 1906.

A revised edition of the Official Automobile Blue Book is now in preparation by the publishers of THE AUTOMOBILE, and will be issued in advance of the 1906 touring season. Since the date of the original publication of this well-known tourists' guide book the facilities for securing accurate road information have greatly increased. Clubs and club members have been gathering an immense amount of data; garages have been established by the score and have, in many instances, become centers of road information; then the various agencies in the cause of good roads have been active in collecting information, and various state and local authorities charged with duties appertaining to the country roads have been accumaulating material, all of which, properly digested and abstracted, has provided an enormous fund of information. This has been supplemented by personal surveys, especially in the vicinity of towns and cities, through which automobile routes are extremely difficult to follow unless properly described.

The scheme of arrangement of the work has been changed to conform to up-to-date requirements. To facilitate ready reference, large folded maps have been discarded, and in their place the text is freely illustrated by pen-and-ink routes and plans of the important centers from which the tours radiate. The correct route is thus graphically indicated alongside the printed description of the route, which is so subdivided by explanatory headings that the tourist can easily locate the necessary information in the guide. In addition to the description of routes, information is given regarding hotel and garage accommodation.

The complete volume will comprise three sections—New England, New York State with Long Island and Staten Island, and New Jersey and Pennylvania. Bound in flexible leather, of a size that will readily fit in a coat pocket, the complete volume will be sold for $3. Those who desire a single section can obtain it bound separately for $1. Advance orders for the book are now being taken by the Class Journal Company, Flatiron Building, New York.

AUTOMOBILE COMPANIES RECENTLY INCORPORATED.

Auto Power & Appliance Company, Cleveland, O.; increase of capital from $35,000 to $200,000.

Automobile Realty Company, New York; capital, $6,000. Directors: A. W. Pross, C. Maurer, G. J. Thomson.

Seaton Auto Tire Company, St. Louis, Mo.; capital, $150,000. Incorporators: Henry Schiel, W. F. Seaton and A. S. Doxsee.

Auto Rapid Transit Company, La Crosse, Wis.; capital, $25,000. Incorporators: A. J. Stephenson, W. J. Brayton and Philip McMahan.

Phœnix Automobile Supply Company, St. Louis, Mo.; capital, $4,000. Incorporators: W. Mulford, Edward Holmes and Freeman Wright.

Automobile Vending Co., Frankfort, Ind.; capital $10,000. Directors: T. E. Brumbaugh, O. E. Brumbaugh and M. E. Brumbaugh.

Kelley-Hunter Company, Chicago, Ill.; capital $15,000; to manufacture automobiles. Incorporators: G. L. Gray, G. P. Rowell, H. A. Ritter.

Ohio Garage and Repair Co., Cleveland, O.; capital $10,000. Incorporators: G. W. Hale, J. O. Lundy, E. T. Gibbons, H. D. Messick, I. D. Hogg.

Paxson Motor Company, Cleveland, O.; capital, $10,000. Incorporators: C. D. Paxson, Robert Drach, C. B. Solders, O. I. Leisy, A. D. Paxson.

Rockland Motor Company; livery and garage; capital, $5,000. Incorporators: T. H. Baldwin, F. W. Barker and E. J. S. Van Houten, Nyack, N. Y.

Motor Car Supply Company, Cleveland, O.; capital, $10,000. Directors: W. B. Drown, F. G. Guthrie, L. H. Drown, E. C. Gesoner, A. P. Graves

H. J. Willard Co.; to manufacture automobiles; capital, $100,000. President and treasurer, H. J. Willard; clerk, G. F. Gould, both of Portland, Me.

Hamilton Automobile Company, Augusta, Me.; to deal in machinery; capital, $50,000. President, A. P. Bibber; treasurer, W. S. Lee; clerk, C. L. Andrews.

Biddle-Murray Mfg. Co., Chicago, Ill.; capital $10,000; to manufacture automobiles. Incorporators: Ralph McShaw, John D. Black, Edward C. Maher.

Motor Directories of New York City, N. Y.; publish motor directories, etc.; capital, $1,000. Incorporators: J. A. Herren, A. P. Young and F. J. Pritchard.

Motor Vehicle Company, Newark, N. J.; to manufacture automobiles; capital, $5,000. Incorporators: Alfred A. Walsh, William F. Kimber, William P. Howe.

Scott-Rankin Company, of El Paso, Tex.; capital, $5,000; to repair automobiles and machinery. Incorporators: H. P. Scott, F. G. Rankin and E. S. Penn.

Atlantic Automobile Company and Machine Works, Atlantic City, N. J.; capital, $50,000. Incorporators: L. H. Hooper, F. A. Broadhead and C. L. Cole.

Glenville Garage & Machine Co., Cleveland, O.; capital, $5,000. Incorporators: J. L. Lewis, J. F. Kritland, C. F. R. Phillips, C. M. Phillips and Oak McCray.

McGiehan Manufacturing Company, New York (manufacture odometers and auto supplies); capital, $20,000. Directors: D. Dacosta, F. S. Sidell, S. D. Fobes.

The Union Automobile Company, Union, N. J.; capital, $10,000. Incorporators: Howard V. Weeks, Frank Hermance, H. J. Ware, H. J. Kaiser, W. A. Maltus.

The Suburban Automobile and Garage Company, Mamaroneck, N. Y.; capital, $25,000. Directors: N. J. Haines, A. Greenwood, N. D. Lawton.

Utica Motor Car Company, Utica, N. Y.; capital, $50,000. Directors: F. P. Miller, H. H. Mundy, E. J. Otis, C. H. Norris, G. H. Norris, A. B. Maynard, T. H. Ferris.

Bergen and West Side Automobile Co., Jersey City; to manufacture automobiles; capital, $9,000. Incorporators, Walter G. Russell, Albert Lanly and Minford Green.

Baker Carmerais Motor Car Company, Boston, Mass.; to deal in automobiles, etc.; capital, $10,000. President, A. E. Baker; treasurer H. D. Carmerais; clerk, A. P. Teele.

New Amsterdam Motor Company, Oswego, N. Y.; to manufacture motors, batteries, etc.; capital, $75,000. Incorporators: Charles Morgan, Joseph Troxell, E. B. Perry.

Foss-Hughes Motor Car Company, Boston, Mass.; to deal in motors, automobiles, etc.; capital, $5,000. President H. W. Knight; treasurer W. J. Foss; clerk, A. A. Knight.

The Adams-Sutton Motor Company, Portland, Me.; to deal in motor vehicles; capital, $40,000. Promoters: Walter O. Adams, David Sutton, Nathan Goold, Charles L. Foster, George H. Allan.

Automobile Import Company, Montreal, Can.; capital, $20,000; to manufacture all kinds of vehicles. The charter members include A. E. H. Crawford, F. R. Crombie and W. W. Skinner, Montreal.

Middlesex Motor Company, New Brunswick, N. J.; to manufacture automobiles, motor cars, bicycles and bicycle parts; capital, $50,000. Incorporators: H. Clark Saunders, Louis A. Voorhees and Charles A. White.

NEWS AND TRADE MISCELLANY.

The American agency for Panhard cars has joined the uptown flight of New York automobile agencies, and will soon be established in new quarters at Broadway and Sixty-second street, where a new building of four stories and basement will be occupied. There is a total floor area of 27,000 feet, a frontage of 89 feet on Broadway and of 87 feet on Sixty-second street. The place will be devoted to sales and repair work and will contain no garage. Showrooms and offices will be on the first and second floors and repair shop and stockrooms above.

The Correspondence School of Automobile Engineering, formerly of Akron, O., has moved to New York city, and is located in the Flatiron Building, Madison Square. Incidental to its change of address, the school has been incorporated under the laws of the State of New York with a capital of $30,000. R. E. Olds has succeeded A. J. Saalfield as president; R. M. Owen has become treasurer in place of E. R. Adam, and Robert H. Montgomery is secretary instead of G. S. Rowe. Victor Lougheed will continue as vice-president and general manager.

Announcement was made on Saturday, November 18, of the sale of the Indiana Automobile Company, of Indianapolis, to Crawford Fairbanks, who at once took possession. It is understood and is not denied that Mr. Fairbanks is acting for other parties, whose identity will not be made public for several days. The Indiana Automobile Company is one of the oldest automobile concerns in Indianapolis. Until Mr. Fairbanks took possession the concern was a stock company. It has taken the Winton agency for 1906.

Efforts are being made to induce Harry Houpt to match Montague Roberts in the six-cylinder Thomas Flier against Barney Oldfield in the new Peerless racer, which has been undergoing a tuning up on the Atlantic City beach during the past week. When approached upon the subject, Mr. Houpt said that Roberts now holds the record, and that when Oldfield breaks his figures Roberts will try again.

The Cleveland Motor Car Company expects its new model to be out next week. The car is rated at 30-35 horsepower. Last year the Cleveland was a 20-horsepower car.

The case of Frank E. Hodge, chauffeur for R. M. Gulick, the theatrical manager, who ran down an Italian named Pocci on July 20 in Schenley Park, Pittsburg, was settled last week in the local courts by Hodge paying the victim $1,250 and the costs of the criminal case, in which he was charged with felonious assault and battery. The Italian took his money and departed for his native land.

William Lamb, erstwhile chief salesman, has been appointed manager of the Fisk Rubber Company's Detroit branch. E. H. Broadwell, in the capacity of vice-president, will continue to look after Fisk interests in the Middle West.

L. G. Martin, the Oakland (Pittsburg) automobile dealer, has let a contract for the erection of a two-story brick garage, 40 by 127 feet. Mr. Martin will handle only the Rambler next year. Besides the two 1905 surrey types which are carried over, there are five new Rambler models, including a surrey, a runabout and three new cars having vertical four-cylinder motors and sliding-gear transmission.

A contract has been let for the building of a macadam road between Lansing, Mich., and Agricultures College, to cost $12,000. The Reo and Olds companies donated $500 toward the fund, and many auto enthusiasts gave smaller amounts.

The Hiland Automobile Company, of Pittsburg, has broken ground for its new garage at 5809-5815 Center avenue, East End, which will be ready for occupancy about March 1. The structure will be of brick and steel, 88 by 115 feet, and will stand thirty-five feet from the building line on a lot 100 by 150 feet. It will have two stories and a finished basement and the walls will be strong enough for the addition of two more stories later. The engine-room will be in the basement and an elevator will run from this to the second floor. The offices and salesrooms on the second floor will occupy 3,500 square feet. A 50-horsepower engine and generator will be installed. The entire outlay will be $50,000. The officers of the company are: President, Dr. John A. Hawkins; secretary, F. T. Saupp, Jr.; treasurer, Dr. George A. Urling; manager, W. A. Richwine.

Webb Jay has actively taken charge of the Chicago agency of the White steamer, having arrived in the Windy City the early part of the week.

Dr. D. D. Culver, a practicing physician of Aurora, Ill., has invented a doctor's runabout automobile, and a company called the Practical Automobile Company, of Aurora, has been incorporated by D. D. Culver, Thomas Greer and Merrick Edwards to manufacture it in that city. The machine is called the Practical. The main features are an air-cooled motor and direct drive on the wheels from the countershaft. The doctor has been at work on the machine for two years and says that his ideas have been patented. A temporary building has been secured for experimental work. If success is attained a permanent building will be erected and the manufacture of the machine for the market will be commenced.

St. Paul and vicinity will undoubtedly soon have some excellent roads, thanks to the persistent efforts of the owners of automobiles. In the budget which is soon to be passed by the city council there is an item of $60,000 to be expended for permanent improvements to existing thoroughfares. St. Paul and Minneapolis will probably be linked together by an excellent macadam highway.

The greatly increased demands made upon the Diamond Rubber Company by the tire trade, as well as its other branches of trade, have compelled the company to arrange for a large increase in its facilities and working capital. It has taken out a new charter in Ohio, transferring from West Virginia, and increasing its capital stock from $1,750,000 to $3,500,000. The company's business has increased greatly, and several additions have been made this year to the plant in Akron. No changes in the styles or makes of Diamond tires are contemplated, as the company is well satisfied with the tests that the tires have been put to the past year, both in endurance and speed contests.

Walter C. Baker, of the Baker Motor Vehicle Company, has become interested in the Mathews Boat Company, of Bascomb, Ohio. This concern has been engaged for several years in the manufacture of gasoline launches and it has turned out many large cruising launches. It is understood that the plant will be greatly enlarged and that the company may remove to some lake- or seaport town.

The next convention of the New York and Chicago Road Association, to be held next March, will probably be held in Hornellsville, N. Y. Chairman W. L. Dickinson, of the committee on location, has recently written to Mayor Charles, of Hornellsville, with regard to the matter, and the Chamber of Commerce has decided to extend a formal invitation to the association.

Baltimore will shortly join the list of municipalities which are employing automobiles for public business. At a recent meeting of the park board the president of the body was authorized to purchase an automobile for use of members of the board and for showing Baltimore's outdoor recreation places to visitors. The make of car to be purchased has not yet been decided upon.

A company subsidiary to the Decauville Automobile Comptny, of New York, has been formed under the name of the Gaulois Tire Company, to handle the Gaulois tire, a French product which is said to bear an excellent reputation in France. Paul L. Snutsel is manager of this and also of a second subsidiary company, the Dac Automobile Supply House, which will have the sole American agency for the Luthi spark plug, the Pognon spark plug and Dupont's siren horn, and will carry as well a full line of ignition apparatus and automobile supplies.

L. A. Mitchell, for several years a salesman with the Decauville Automobile Co., of New York, and who rode with Guy Vaughan in the remarkable 1,000-mile track run made in a 40-horsepower Decauville racing car, has been appointed assistant secretary of the New York Baseball Club. He will do much of his traveling in a 30-35-horsepower Decauville car purchased for the use of club officials.

Prof. Charles M. Barber, for the past year in charge of the history department of the Lansing, Mich., high school, has resigned his position to accept the post of sales manager for the Reo Motor Car Company in the City of Mexico.

Frank B. Stearns, of Cleveland, who was severely injured by a collision of his car with a farmer's wagon and the overturning of the machine a few weeks ago, is on a fair way toward recovery, but it will be several weeks before he can be out to attend to business.

The Norris N. Mason Company, 32 West Thirty-second street, New York, American agent for the Léon Bollée cars, has announced its ability to execute promptly all orders for 1906 Bollée cars, and to make delivery on date contracted. In order that the company might be able to make this assurance, orders for bodies were placed as early as last August, and are now being executed by Rothschild & Kellner, of Paris, and Locke & Co., of New York.

Hollander & Tangeman, who are the exclusive agents for the Fiat automobiles in the United States and Canada, have closed a contract with the makers of this car for 1,500 Fiat automobiles, to be taken in a period of ten years. With the beginning of 1906 a stock company is to be formed, to be known as the Hol-Tan Company, who will take over this business.

The Acme Motor Car Company, of Reading, Pa., has been purchased by a number of capitalists for the reported sum of $250,000. Frank A. Devlin, of Chicago, and his son, A. A. Devlin, who formerly represented the Acme company in Chicago, were the prime movers in the transfer, and will, to a great extent, control the new company.

Thomas A. Egan and F. G. Grinnell, of Narragansett Pier, R. I., will establish a garage in connection with the Clarendon Hotel, at Sea Breeze, Fla.

The C. Z. Kroh Manufacturing Company, of Toledo, O., makers of auto tops, will remove about December 15 from the present location at 120 St. Clair street, to the new building now being erected on Jackson avenue, between Twelfth and Thirteenth streets, where the company will have double its present capacity.

The Milburn Wagon Company, Toledo, O., states positively that, contrary to reports recently circulated, it is doing nothing in the way of building automobiles.

W. S. Austin, of Grand Rapids, Mich., has brought out a device for preventing the severe and quick recoil of the springs when a car is traveling over rough or uneven roads. The device, which is very simple and readily adjusted, allows the spring to depress easily, but retards it going back to place.

The Jackson Body Company, Jackson, Mich., manufacturers of carriage and automobile bodies, is in the hands of Z. C. Eldred, receiver, under a trust mortgage.

O. W. Anderson, 511 Masonic Temple, Minneapolis, Minn., is interested in a company which expects to build 100 automobiles during the coming year. A location somewhere in the Twin cities is now being sought.

The Stirling Automobile Company, late of 51 Woodward avenue, Detroit, Mich., and which handled the agency for the Pierce and Studebaker cars, has discontinued business.

J. P. Schneider, 187-189 Jefferson avenue, Detroit, Mich., has relinquished the Peerless and Buick agencies, and has taken on the Pierce.

Charles H. Grant has resigned the management of the Ford retail store in Detroit and taken a position with the Buick Motor Company, and after making a trip through the South in the interest of this company will take up the management of the Detroit branch, which the Buick company will shortly open.

J. A. Swinehart, of the Swinehart Clincher Tire and Rubber Company, returned to Akron, Ohio, November 13, from an extended trip in the West in the interest of his tire. Among the cities visited were San Francisco, Oakland, Salt Lake City, Denver and Kansas City. Mr. Swinehart reports that there will be an exceptionally large business on the coast and in the Western states by automobile builders the coming season.

Alexander Winton and Harold Anderson, of the Winton company, left last week for Europe. They will take in the London and Paris shows.

Ralph Temple has added the National car to his list and will handle this car in Chicago in addition to the Reo, Premier and Panhard machines. The National was formerly carried by the Hayden Automobile Company.

The Bennett-Bird Company, 1404 Michigan avenue, Chicago, in addition to handling the Corbin cars, has taken the agency for the Dolson line, and will represent the Dolson company in the middle west.

The Detroit Motor Car Company, Detroit, Mich., has secured the agency in that city for the Peerless cars, and is temporarily located at 170 Jefferson avenue.

A. S. Robinson, formerly sales manager with Charles A. Duerr, is now connected with Harry S. Haupt, who has the New York agency for the Thomas car.

A new garage now being erected in Detroit is that of the North Woodward Garage Company. The building is being erected at 18 Piquette avenue, and is to be two stories in height, 30 by 130 feet.

INFORMATION FOR BUYERS.

BRIGHTEN THE PAINT.—Time and the continual attacks of mud, dust and water will, sooner or later, make necessary a renewal of the paint on the automobile body; but the visit to the paint shop may be considerably delayed by taking good care of the paint. To help the automobilist to keep his car looking fresh, a preparation called "Mobo" has been placed on the market by John T. Stanley, of New York, for freshening and brightening the paintwork after the mud and dirt has been washed off. The preparation is applied after the car has been washed in the ordinary way, and the manufacturers state that it greatly improves the appearance of the finish, removing grease and grime and polishing the surface without in any way injuring the paint. It is a vegetable oil compound and contains nothing injurious to the human skin. "Mobo" is said to be excellent for cleaning leather. It is put up in cans.

SPRINGFIELD TOPS.—The many good features of the folding top or cape cart hood for automobiles have made it very popular for touring cars, as it gives protection from rain, wind or hot sun without the weight

SPRINGFIELD SIX-BOW TOP.

and expense of a standing top, and can be folded back entirely out of the way when not required. The accompanying engraving shows a six-bow top made by the Springfield Metal Body Company, of 380 Birnie avenue, Springfield, Mass., for a very large car seating seven passengers. This top not only extends over the driver's seat, but projects forward to the middle of the long bonnet over the engine.

TRADE BREVITIES

C. L. Scrivens has opened a garage and salesroom in Ashtabula, O.

The Capitol City Automobile Company, of Columbus, O., has assigned.

A plant for the manufacture of automobile bodies will be erected in Columbus, O., by George Heinlein.

The Hiland Automobile Company has taken the agency in Pittsburg for the Thomas car for 1906.

An automobile line is in operation between Urbana and Mechanicsburg, O. John Jenkins controls the line.

A new garage has been opened at 130 East Ninth street, Cincinnati. Robert C. Crowthers will be manager.

The Liberty Automobile Company, of Pittsburg, has secured the agency for the National car for next year.

The Detroit Motor Car Company, Detroit, Mich., has secured the local agency for the Packard and Peerless cars.

The Cleveland Auto Car Company will establish an agency in Cincinnati when a suitable location has been secured.

Benjamin Webster has opened a salesroom at 251 Jefferson avenue, Detroit, and has taken the agency for the Welch cars.

The Butler Motor Car Company, of Boston, will handle the Pierce Racine cars in addition to the Cleveland cars during 1906.

P. E. Hawley has been appointed manager of the Detroit branch of the Continental Caoutchouc Company, 260 Jefferson avenue.

C. H. Torrey has resigned the Knox agency in New Haven, Conn., and has been succeeded by E. T. Hale, 166 St. John street, New Haven.

The Standard Foundry Company, of Hartford, Conn., is now making a specialty of aluminum and bronze castings for automobiles and auto boats.

The Rapid Motor Vehicle Company, Pontiac, Mich., is working on a twenty-passenger sightseeing car, which will be exhibited at the shows this season.

The 1906 agency for Franklin cars in Colorado Springs has been taken by W. J. Batchelder, president of the Anthony Motor and Manufacturing Company.

George H. Lowe, formerly manager of the New England branch of the White Sewing Machine Company, has taken the Wayne agency for New England.

Harry Marvel, formerly with the Pope Manufacturing Company, has accepted the position of manager of the Quaker City Automobile Company, Philadelphia.

Harry Cunningham has sold his interest in the Detroit Automobile Company to his partner, F. G. Smith, and will assume the management of the Ford branch in Cleveland, O.

Young & Miller, 254 Jefferson avenue, Detroit, have been succeeded by Fee & Bock, Mr. Young retaining his position as manager, and the company continuing to act as agents for the Elmore cars.

F. W. Sanborn, of Concord, N. H., will handle the Thomas cars during 1906, and the Maine Motor Carriage Company, of Portland, Me., has taken the agency for the car throughout the state of Maine.

The Excelsior Supply Company, of Chicago, is erecting a three-story building on Michigan avenue, which it will occupy as a local retail branch. The company hopes to be able to occupy the building by January 15 next.

An automobile garage has been opened in Cincinnati by R. C. Crowthers, who has leased the property at 130 East Ninth street. Mr. Crowthers is negotiating with several automobile manufacturers and expects to secure the agency for some well-known cars.

W. W. Sears has recently been appointed agent for the Reo Motor Car Company in Des Moines, Ia., and vicinity. The company recently made a 1906 connection with the Wichita Auto Company, of Wichita, Kan. The Corn Belt Auto Company, of Waterloo, Ia., will handle the Reo cars during 1906.

During the recent trans-continental trip of the exposition car of the Winton Motor Carriage Company, which recently ended in Stockton, Cal., the company's new Model K was exhibited in twenty-five cities, the car having been on the road fifty-five days and having passed through seventeen states and Canada.

The Packard Motor Car Company, of Detroit, Mich., recently purchased a large piece of ground immediately adjoining its present factory on Grand Boulevard, on which it will erect a plant for the manufacture of the Packard commercial vehicles. This addition will enable the company to devote the whole of the present plant to the output of touring cars.

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SPECIAL NOTICES

Advertisements inserted under this heading at 20 cents per line; about 7 words make a line. Remittance should accompany copy. Replies forwarded if postage is furnished.

A FIRST-CLASS chauffeur, with factory, road and garage experience, desires position on Pierce Arrow, Thomas Flyer, locomobile or Pope Toledo; best of references; and will go anywhere. Address Chauffeur, care of Herkimer Motor Car Co., Herkimer, N. Y. Nov23

AUTOMOBILE BARGAINS—Through a business deal we obtained a few standard $1,400 side entrance touring cars, 20 h.p., double opposed engine, and $750 runabouts, made by one of the oldest automobile makers in the country; all new goods; shipments made direct from the factory; full description on application; the opportunity of a lifetime; write to-day making best cash offer; having already made our profit on these cars we can afford to let them go at a sacrifice; best cash offer takes first machine, next best second, etc., until closed out, regardless of cost; no trades. Skinner & Skinner, 4131 Indiana ave, Chicago, Ill. tf

AUTOMOBILES, $150 to $2,500, carrying the largest stock of slightly used automobiles in the world; we offer a diversity of prices that will meet every purse, and quickly satisfy every demand; we can state positively that we have more automobiles here than you will find at all the other New York dealers combined. As a sample of prices and values we quote, Mobile steamer, $150; Loco runabout, $150; Rambler runabout, $200; other runabouts up to $600; over 100 tonneaus, $350 up. We have every make in gasoline, steam or electric. In addition to the 250 cars here, we have a list of over 100 others whose owners are anxious to sell. You waste money and time going elsewhere. Also all parts to build an automobile. Mobile and Prescott engines, boilers, burners, running gears, wheels, tires, baskets, lamps, and horns. Also all mobile parts. Write, call or 'phone for our special bargain list. Manhattan Storage Co., largest auto dealers in the world, 334-340 West 44th st., N. Y. City, N. Y. Nov23

BICYCLE, Auto and light machine business for sale, located in New Jersey, Jersey, care The Automobile. Nov30

BARGAINS FOR QUICK SALE"—One 1905 Cadillac touring car, has Cape top, searchlights, etc.; cost $1,130; price $775; one White steam stanhope, $350; one White touring car, $795; model "A" Cadillac with tonneau, good as new, $375; one 1905 Franklin touring car, good as new, $1,150; all guaranteed in perfect condition. Halsey Auto Co., 3910 Oliver st., St. Louis, Mo.

FOR SALE—4-cylinder, 16 h.p. air cooled motor. C. A. Ross, Little Falls, N. Y. Nov30

FOR SALE—15-tube radiator, $10, other sizes dirt cheap. Symonds, 901 N. Fairfield Ave., Chicago, Ill. t.f.

FOR SALE—Marble swift friction transmission, lever, joints, brake, new, bargain 729, 164 Dearborn, Chicago. Nov23

FOR SALE CHEAP—A second hand White steamer, good as new; fully equipped. Address Box 1468, Bellingham, Wash. Nov 23

FEBRUARY 14, 1903—A copy of The Automobile of that date; who has one for sale? The Automobile, Flatiron Building, N. Y. Nov23

FOR SALE—A 1905 Olds Runabout in first-class condition, or to trade for larger car, Address Herkimer Motor Car Co., Herkimer, N. Y. Nov23

FOR SALE—One model L Packard, guaranteed in fine condition, new tires two months ago; bargain at $1,750. Address C. M. P., The Automobile. Nov23

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